

U.S. PLANT INTRODUCTION STATION
11601 Old Pond Road
Glenn Dale
Prince George's County
Maryland

HAER No. MD-122

HAER
MD,
17-GLDLE,
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Philadelphia Support Office
U.S. Custom House
200 Chestnut Street
Philadelphia, PA 19106

HISTORIC AMERICAN ENGINEERING RECORD

U.S. PLANT INTRODUCTION STATION

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17-GLDLE,
1-
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Location:

11601 Old Pond Drive, Glenn Dale
Prince George's County, Maryland 20769

UTM: 18.343410.4314600 18.343880.4313880
 18.343410.4314520 18.343880.4314040
 18.343500.4313520 18.343710.4314040
 18.343500.4313880 18.343710.4314780

Quadrangle: Lanham, Maryland, 1:24,000

Date of Construction:

begun 1919

Engineer, Etc.:

U.S. Department of Agriculture's Office of Public Roads and Rural
Engineering, Division of Rural Engineering

Present Owner:

Agricultural Research Service, U.S. Department of Agriculture
Building 003, Beltsville Agricultural Research Center, Beltsville, MD

Present Occupants:

Agricultural Research Service -- Beltsville Area: Floral and Nursery
Plants Research Unit, U.S. National Arboretum; National Germplasm
Resources Laboratory of the Plant Sciences Institute

Present Use:

Federal quarantine and pathogen detection and elimination services for
clonally- and seed-propagated plant germplasm introduced into the
United States from other countries.

Significance:

The U.S. Plant Introduction Station at Glenn Dale was one of four
federal stations established to receive plant materials into the United
States, test them for suitability for more extensive trial, and, if suitable,
increase and distribute the plants. Glenn Dale was distinct for the role
that it evolved as the center of the USDA's plant quarantine activities.

Project Information:

With the recent construction of a state-of-the-art plant quarantine
facility in Beltsville, the Agricultural Research Service is transferring
many of the activities from Glenn Dale. The site will continue to be
occupied by the U.S. National Arboretum. To mitigate the adverse
effect of demolishing some of the buildings, the State Historic
Preservation Officer stipulated documentation of the 70-acre site.

This document was prepared by Heather Ewing (Associate) and Judith
Robinson (Principal) of the firm Robinson & Associates, Inc., 1909 Q
Street, N.W., Suite 300, Washington, D.C. 20009

INTRODUCTION/SUMMARY

The U.S. Plant Introduction Garden at Glenn Dale, Maryland (later known as the U.S. Plant Introduction Station), was established in 1919 by the U.S. Department of Agriculture for the purpose of testing plants of potential economic benefit to the United States. One of four such federal introduction gardens across the country (and one of only two operational today), the Glenn Dale station received an enormous range of plant species from around the world and served as an important source of seeds, plants, cuttings, and associated information for use by growers. Established in close proximity to Washington, the Glenn Dale station was the only one of the four stations that serviced the central Agriculture Department headquarters and the Inspection House, which was the first stop for plants entering the United States. For nearly all of its history, it was the center of plant quarantine facilities for the entire Department of Agriculture and the most highly developed of the four stations. Because of its ample greenhouse units and facilities for propagation of all plants, the Glenn Dale station was typically the one selected for extensive propagation activities, both for specialty items for within the United States and for the government's foreign aid programs.

I. DESCRIPTION OF THE U.S. PLANT INTRODUCTION STATION AT GLENN DALE, MD

The U.S. Plant Introduction Station at Glenn Dale, Maryland, is located on a 70-acre site about 16 miles northeast of Washington, D.C.¹ To the west of the property is the abandoned Glenn Dale Hospital, a large multi-building facility run by the District of Columbia early in the century as a Tubercular Sanatorium. The road running along the north of the property is called Old Pond Drive, and the pond of said name is located in the northwest corner of the Glenn Dale station site. The property as a whole is L-shaped. The longer leg of the L, running north-south, comprises the original 50 acres purchased by the government in 1919. Twenty additional acres were leased in 1930 and subsequently bought in 1940. These 20 acres, comprising the shorter leg of the L, run east-west along the southernmost part of the property and extend east over Lottsford Branch. The majority of the site is cultivated as fields and orchards for propagation and testing; during much of Glenn Dale's history, 65 of the 70 acres were in use.

The buildings of the station are clustered together in a small portion of the property at its northeast corner. Many of the buildings are attached to one another, creating a complex maze of interrelated buildings and supporting structures. The earliest construction on the site included a long headhouse (Building 4) with two large greenhouses attached (Buildings 5 and 6), several barn structures for storing equipment and for packing plant materials for distribution (Buildings 20, 42, 43, 44), and three cottages for the superintendent and essential staff (Buildings 32, 33, 34). Subsequent structures were built on this framework, including more greenhouses and screenhouses and new and more permanent headhouse/office space. The general character of the site is a uniform and rural one, because the bulk of construction occurred between 1920 and 1937, during the first two decades of the station's existence and the height of its period of significance. Constructed of like materials, the buildings are

¹The old Washington-Baltimore-Annapolis trolley line ran along the property to the north, and the convenient Bell Station stop which serviced the Glenn Dale site gave the U.S.D.A. property the informal name of "Bell Station."

virtually all one-story structures. The complex has changed little in recent years, aside from the reconstruction of most of the greenhouses and the deterioration of the wood-frame structures. The construction of the 1940s and 1950s was very much in keeping with the scale of the station as it was established in the 1920s and 1930s; there has been almost no new construction at the site since the 1950s, except as relates to the recent activities of the Woody Landscape Plants Germplasm Repository of the U.S. National Arboretum (USNA). For the USNA program, the Seed Storage Building (Building 21) was renovated in 1986 to contain office and laboratory space, and in 1991, a 1,200 square foot prefabricated metal storage building (Building 46) was erected.

PLEASE NOTE: As part of this study, the following buildings in the complex were individually photographed and assigned an extension of the base HAER number:

U.S. Plant Introduction Station, Main Office Building	HAER No. MD-122-A
U.S. Plant Introduction Station, Main Headhouse and Lean-to Greenhouses	HAER No. MD-122-B
U.S. Plant Introduction Station, Greenhouses #1 and #2	HAER No. MD-122-C
U.S. Plant Introduction Station, Greenhouses #3, #4, #5, #6, #7, #8	HAER No. MD-122-D
U.S. Plant Introduction Station, Buildings 13, 14, 15, 16, 17	HAER No. MD-122-E
U.S. Plant Introduction Station, Pumphouses	HAER No. MD-122-F
U.S. Plant Introduction Station, Packing Shed	HAER No. MD-122-G
U.S. Plant Introduction Station, Soil Conservation Service Cluster	HAER No. MD-122-H
U.S. Plant Introduction Station, Quarantine Headhouses and Greenhouses	HAER No. MD-122-I
U.S. Plant Introduction Station, Cottages	HAER No. MD-122-J
U.S. Plant Introduction Station, Quarantine Screenhouse	HAER No. MD-122-K
U.S. Plant Introduction Station, Barn and Shed Buildings	HAER No. MD-122-L

General Architectural Characteristics

There are three basic types of building materials at the Glenn Dale station: wood-frame structures, which include the barn buildings and the cottages; glass greenhouses with wood or aluminum frames; and unadorned concrete block buildings with pitched gable roofs, which serve as office and laboratory space.

The buildings erected by the U.S. Department of Agriculture's Division of Rural Engineering in the 1920s are characterized by wood-frame construction, horizontal clapboard siding, and large multi-paned windows. These include the original 1920 headhouse, the 1922 storage/distribution shed, and the grouping of barn buildings (called farm implement sheds), constructed and added to between 1920 and 1929, located to the southeast of the principal cluster of buildings. The other wood-frame buildings of the 1920s are the three residences: one-story bungalow-style cottages with porches and shingled facades.

The greenhouses, beginning with the first two constructed in 1920 by the American Greenhouse Manufacturing Corporation, are large glass-wall structures with either aluminum/metal or wood framing. Because of the necessity at Glenn Dale to separate various crops, the predominant type of greenhouse erected at the site was a detached house. These individual houses were connected only by a long headhouse, thereby preventing the spread of pests or diseases. The other type of greenhouse popular in the United States in the 1920s and 1930s was the ridge-and-furrow greenhouse, which

essentially consisted of one large house with separate pitched roofs, a type not well suited to a plant introduction station.

Beginning in 1931 with the construction of the main office, concrete block became a major building material at the Glenn Dale station. With their pitched gable roofs and chimneys, these concrete block laboratories and office spaces resembled small cottages and were distinctly unindustrial in appearance. They were painted white and, although architecturally unadorned, were substantially enhanced with exterior plantings.

Another significant characteristic of the buildings at Glenn Dale is their interconnected nature. Many of the buildings at the Glenn Dale station are attached to one another, creating a complex maze of interrelated buildings and supporting structures. Most of the scientifically related buildings in the heavily developed section of the site are interconnected by screenhouses, headhouses or other forms of connecting buildings. This characteristic of construction at the site dates from early in the station's development and was considered an important aspect of controlling entry of insects or other diseases, most specifically the Japanese Beetle.² Virtually all the greenhouses were accessed by a screened porch or headhouse.

Description of Individual Buildings

The Main Office Unit: Buildings 1, 2, 3

The Main Office of the Glenn Dale station (comprised of Buildings 1, 2, 3) was constructed in 1931, of the cinderblock materials that have become the primary building fabric of the site. It is a U-shaped building with glassed-in (originally screened) walkways, called Japanese Beetle corridors, connecting the wings (Buildings 2 and 3) with the central block (Building 1). The small-scale, one-story building and its wings are characterized by strongly pronounced gables. These gables are covered in lapped clapboard siding. Benjamin Y. Morrison, who directed the largest azalea breeding program in the United States from the Glenn Dale station, conceived the design for the building as an English cottage.³ Trellises originally covered the bare, concrete-block, east facades of the main building and its wings [see View of Main Office, ca. 1950]. The trellises on the central block surrounded three elegant 16-pane wood-frame windows in the shape of French doors. The middle of these three windows was replaced at some later date with a push-bar metal door. Building 2 features only one small casement window on its south facade; Building 3 is punctuated by two large eight-over-eight

²Harry A. Gunning [Associate Horticulturist in Charge, later Superintendent, Glenn Dale Station] to Knowles Ryerson [Foreign Plant Introduction, Bureau of Plant Industry], March 6, 1928. "The rapid spread of the Japanese Beetle and the possibility that it will reach this section during the next two seasons indicates that it would be advisable to begin protective measures which will then be imperative." National Archives and Records Administration (NARA), Record Group 54 (Records of the Bureau of Plant Industry, Soils, and Agricultural Engineering), Entry 135F, Box 6.

³Oral interview with Dr. J.L. Creech, June 14, 1995. A "Plan of the Office Unit at Glenn Dale," dated 1937, located at the Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426, has a pencil note on the verso: "Original plan of office unit as prepared by B.Y. Morrison."

metal-frame double-hung windows on its north facade.

A variety of functions were housed in the building. As the central office, Building 1 contained the records and files and provided a meeting point for staff; its wings contained a seed and bulb storage area on one side (Building 2) and a laboratory and darkroom on the other side (Building 3).

The Headhouse: Building 4

Extending west from the main office is the headhouse (Building 4), a long one-story structure which serviced the propagation greenhouses and housed the boiler room, lockers, and lavatories. It is a narrow building with a gable roof, its north facade punctuated by a number of doors and metal-frame casement windows, and its south facade characterized by large wood-frame openings to several of the greenhouses. It is located on the same site as and shares the basic footprint of the original 1920 wood-frame headhouse. This original headhouse was one of the first buildings constructed for the fledgling Plant Introduction Station and was the center of the station's activities [see *The Headhouse*, May 1920]. When the main office (Building 1) was constructed in 1931, the headhouse was extended and connected by a Japanese Beetle corridor to the new central office. At the time of this extension, the wood-frame headhouse was most likely reconstructed with concrete blocks.⁴ This building, which was called the Head House Service Building on early maps, also functioned as the potting room and locker room for staff; it contained a lavatory in the southwest corner and a boiler room in the northwest corner. The northwest corner functions today as a lavatory.

In the daily functioning of a plant introduction station, the headhouse plays a critical role, providing controlled access to the greenhouses as well as a central point of communication for the station's staff. The propagation greenhouses located to the south of the headhouse, in particular Buildings 5 and 6, were the site of some of the most important work accomplished at Glenn Dale; during World War II the houses were given over to the cultivation of some four million cinchona seedlings, for the production of quinine. Although the original 1920 headhouse was of wood-frame construction, the subsequent renovation of the house in the early 1930s, which resulted in a concrete block structure, occurred within the site's period of significance and does not materially alter the building's integrity. The building, with its concrete block construction, now blends with the context established by the main office (Building 1), and it also appears to share a fenestration pattern similar to the original clapboard-sided headhouse.

Lean-to Greenhouses of the Headhouse: Buildings 22 and 23

In 1937 (Building 23) and 1941 (Building 22), two lean-to greenhouses, were constructed along the north facade of the headhouse. Building 23, the northwest lean-to, contained 490 square feet; Building

⁴On the annotated *Glenn Dale Map*, September 5, 1937, featuring the building square footage, the Head House Service Building is dated 1931-32. Facility Engineering Branch, Beltsville Agricultural Research Center (BARC), Building 426.

22, the northeast lean-to, contained 280 square feet.⁵ These lean-tos are wood-frame glass houses set on concrete footers. On the interior are the original wooden propagating benches, which have metal legs with oil cups at the knee, an early form of pest control [see for example, View East, Interior Lean-To Greenhouse (Building 24)].

Greenhouses #1 and #2: Buildings 5 and 6

Buildings 5 and 6 are two large greenhouses attached on the south side of the headhouse. Known originally as Greenhouses #1 and #2, Buildings 5 and 6 are cypress wood-frame glass greenhouse structures with pitched roofs and terracotta block and concrete foundations. Both greenhouses are compartmentalized; Greenhouse #1 has a center aisle with side benches, and Greenhouse #2 has two side aisles, with benches both in the center and along the side walls. Along the ridge of the roof in each of these greenhouses are fixed fine-mesh screen panels, with ventilation louvers that run along both the east and west sides of the roof gable. These houses are located on the same site as, and represent the continuation of the original two greenhouses for the fledgling Plant Introduction Station [see *The Greenhouses*, May 1920]. They were renovated in 1957 (Building 6) and 1961 (Building 5). Each contains some 5,400 square feet of space. These propagation houses were the site of some of the more significant plant introduction work done at Glenn Dale, including the massive cinchona production project during World War II [see "Chaulmoogra Plants, Source of the Drug Believed to Cure Leprosy"].

Greenhouses #3, #4, #5, #6, #7, #8: Buildings 7, 8, 9, 10, 11, 12

Buildings 7, 8, 9, 10, 11, and 12 represent the continuation of greenhouses along the south side of the original headhouse. This grouping of greenhouses was constructed (or reconstructed) over an extended period of time from approximately 1923 to 1980. The grouping is now fundamentally organized by an attached unnumbered screenhouse which runs along the north side of the complex and provides access to the greenhouses as well as a storage shed [see Building 16 below]. There is a virtually identical screenhouse that runs along the south end of these greenhouses.

Buildings 7, 8, and 9 were originally known as Greenhouses #3, #4, and #5. Reconstructed around 1980, they are nearly identical modern metal-frame greenhouses. Building 7, measuring 1,853 square feet, is the earliest of the three, originally erected in 1923; it is accessed directly from the main headhouse (Building 4). It features screened ventilation panels only on the east side of the roof ridge; single panes form the plane of the pitch on the west side. On the interior, there is a single center aisle, with benches on either side. The compartments at the south end of the greenhouse feature an extensive lighting system, installed to extend the daylight hours for propagation. Building 8, a pit house measuring 1,840 square feet, was first completed in 1927. Accessed by a small, wood-frame, clapboard-sided gable house, this greenhouse is sunken in the ground, with the glass panels of the greenhouse gable beginning at ground level. It has no benches, featuring instead concrete beds. Building 9, also accessed by a small gabled house, measures 2,057 square feet. It was first completed in 1930. The first compartment of the greenhouse is at ground level, with wooden benches lining the

⁵This square footage and virtually all subsequent ones were taken from the 1958 annotations on the *Glenn Dale Map*, September 5, 1937, located at Facility Engineering Branch, BARC, Building 426.

sides; the southern end of the greenhouse is sunken, with the original cement block foundation used as the beds.

Buildings 10, 11, and 12 are accessed through small wood-frame gabled structures that shelter the steps that lead down into the slightly submerged structures. These gabled structures are attached to the long, narrow, unnumbered wood-frame screenhouse that is a central element in this grouping of buildings. Buildings 10 and 11 are low wood-frame pit structures in which only the glass gable of the buildings is above ground. They date to 1931 (Building 10), 1932 (Building 11), and 1933 (Building 12). All three of these greenhouses are in extremely poor physical condition with significant sections of glass missing and portions of the roof collapsed. Building 10 has 1,350 square feet of space; Building 11, which is not heated like the others, has 1,332 square feet; and Building 12 has 1,628 square feet. Building 10 is a wood-frame structure, with every fourth panel on the east side of the gable functioning as a movable ventilation panel, attached by canvas straps at the roof ridge and with fixed screening underneath. Building 12, of wood-frame construction, is taller than Buildings 10 and 11, with one tier of vertical wall glass panels in addition to the gable of the roof above ground. In some areas, as part of the renovation work, the wood mullions have been covered with metal sheathing. When this greenhouse was erected in 1933, a small, wood-frame, glass lean-to was erected at the same time connecting along the southern elevation of Buildings 10, 11, and 12 [see Building 15 below].

Buildings 13, 14, 15, 16, 17

Building 13, a bunker-like underground plant storage facility, was originally referred to as Greenhouse #9. Built in 1934, it contained 450 square feet and was not heated. It is of concrete construction, with a raised concrete footer supporting a flat wood-frame roof structure. This pithouse is accessed from stairs housed within the wood shed attached on the north facade of Building 14.

Building 14, also built in 1934, is small cinderblock structure with a wood-frame, overhanging gable roof with bracketed eaves. The structure is attached at its north elevation in the center bay to Building 13, with the end bays each featuring a metal-frame casement window covered by a convex, triangular wood-frame screen. At its east elevation, Building 14 is linked to Building 15, at its south elevation to Building 17, a large wood-frame screenhouse. The south elevation features a single metal-casement window in the easternmost bay. The west elevation has a single opening, a wooden door with four large lights in its upper half. The building functioned as a cold storage facility and was used for keeping seeds and/or plants. Many plants arriving at Glenn Dale required an artificial winter before growing successfully. This function was clearly a vital one for the station; correspondence from the earliest years of the station's operation discusses plans for "a cool room -- one using ice bunkers only, and the other using a tank in which ice and salt are placed and a circulating brine carried through pipes down into the room below."⁶

⁶B.T. Galloway [Bureau of Plant Industry] to David A. Bisset [Superintendent of Glenn Dale], May 22, 1923. Galloway explains that the plans are being developed by a Mr. Dennis, the refrigerating expert of the Bureau of Plant Industry, and that the plan using the tank is the one used "at Arlington Farm in Stuart's potato cool room." RG 54, Entry 135F, Box 4.

Building 15 is a small lean-to greenhouse attached at the southern end of Buildings 10, 11, and 12. Built in 1933, it contains 398 square feet. Building 16 is a large concrete-block structure with an overhanging hipped roof with bracketed eaves. The north and west elevations feature six-over-three metal-frame casement windows. The north elevation is three bays across, with a wood door with four large lights in its upper half in the easternmost bay, and a window in each of the other bays; the west elevation has a pair of large central wood doors, with two windows in the bays to the north and one to the south. Wrapping around the south end of the building, underneath the eaves, is a wood-frame screened-in area. The east elevation is punctuated by several small wood-frame screened openings. The building served as storage for soil and greenhouse pots. It was built in 1931.

Building 17 is a large, wood-frame screenhouse, measuring 2,201 square feet. Originally erected in 1931, the building was renovated in 1959. It is built atop a concrete block foundation and features a poured concrete floor and a flat roof of corrugated plastic.

Pumphouses: Buildings 18, 35, 36

Buildings 18, 35, and 36 are small-scale, freestanding, wood-frame pumphouses. Designed by the Department of Agriculture's Division of Rural Engineering, these pumphouses were built in the early 1920s, as part of the earliest efforts to provide a water, sewage, and irrigation system for the fledgling station. Building 18 was erected in 1923; Buildings 35 and 36 in 1920. Building 18, oriented in an east-west direction, is located to the east of the lathe screenhouse (Building 17), close to the principal cluster of propagation greenhouses. It is a small, wood-frame shed with an overhanging gabled roof that functioned as a pumphouse, supplying drinking water.⁷ Building 35 is located to the west of Cottage #2 (Building 34), close to the pond at the northern perimeter of the property. This wood-frame gabled shed is the largest of the three, with windows and a four-light door accessing the interior. It provided water for the greenhouses. Building 36, located in a cluster of bamboo near the principal entrance to the station off Old Pond Drive, is a very small wood-frame gabled shed. It functioned as the station's sewage pump.

Storage and Packing Shed: Building 20

Building 20 was among the earliest buildings constructed for the Plant Introduction Garden. Designed by the Department of Agriculture's Division of Rural Engineering in 1922, it was intended for use as a storage and packing shed. It is a typical frame farm building with wood siding and large barn-type entrance doors located on the east and west facades. On the west facade six-over-six windows with wide wood lintels frame a wooden door at the north end of the facade; at the south end of this elevation are the large paired barn doors and a single window with six vertical-pane lights separated by wide wood mullions. Small louvered vents, covered by hinged wooden panels, punctuate the facade underneath the roof line. The east facade has two large openings at either end of the elevation. The north facade, which is connected to the greenhouses, features several six-over-six windows, including a paired window adjacent to a central door with a two-light transom, and an interior chimney in the western corner. The south facade has no openings. The building is similar in style to the earliest original headhouse at Glenn Dale as well as to the farm building grouping to the south.

⁷The separate functions of the three pumphouses were determined from the 1959 Plan of the Building Area.

Attached in the early 1920s to the first two greenhouses (Buildings 5 and 6), the building served a critical supporting role in the plant introduction work of the station. It was here that the plants approved for distribution were packaged to be sent out across the United States. Although few alterations appear to have been made to the building, the structure is in extremely poor condition. Parts of the ceiling have caved in and there is evidence of severe water damage throughout the building. Most recently the building was cordoned off because of the danger of electrical shock hazard as a result of intermittant standing water.

Seed Storage Building: Building 21

Building 21 is a cement block building erected in 1951-52. Building 21 was used as a seed storage building, to maintain a repository of the items that passed through the station. The building was equipped with a refrigeration system to prolong the life of the germplasm. In 1958, a national seed storage program was established at Fort Collins, which thus served as the principal and official keeper of all germplasm introduced into the United States. Glenn Dale's role as the unofficial repository of germplasm was succeeded by this system, which lessened the need for this building only a few years after its construction. The building was renovated in 1986 and is currently used as office and laboratory space for the Tree Building Program of the USNA's Floral and Nursery Plants Research Unit.

[Buildings 22, 23: See Building 4]

Soil Conservation Service Headhouse and Greenhouse #10: Buildings 24, 25, 26

Buildings 24, 25, 26 are an ensemble designed by Frederick Bradford in 1937 for use by the Soil Conservation Service. Building 25 was designed as the office, laboratory, and headhouse for Greenhouse #10 (Building 26) and the adjacent lean-to greenhouse (Building 24). Square in plan, with a steeply pitched gable roof, chimney, and large 16-pane casement windows, Building 25 follows the English Cottage model established with Building 1. This concrete block office and laboratory has the appearance of a small house. It was sited in a north-south direction as part of a row of concrete block buildings [see Buildings 27, 31 below] begun in the early 1930s. The placement of these structures creates a small alley that runs east-west between the main headhouse (Building 4) and the plant quarantine facilities (Buildings 27, 31). The grassy alley, which leads from the parking lot to the rear side of Building 3, is heavily planted.

Building 24 is a cinderblock lean-to structure, reinforced with a metal structural frame, with a northern exposure. It contains 330 square feet of space. It is accessed both by an interior door from Building 25, and by a small wooden exterior door in the west end gable; the door has four large lights in its upper half. Along the north wall is a row of benches, which feature metal legs with oil cups at the knee, a form of early pest-control. The uppermost section of the roof ridge is screened for ventilation.

Building 26, originally known as Greenhouse #10, measures 1,620 square feet. It is a wood-frame glass house, atop a concrete footer; in some areas the wood mullions have been sheathed in metal. Along the sides of the greenhouse are metal tie-rods, used originally to tie down netting or other materials that were thrown over the greenhouses occasionally during the summer months. There is a central, multi-light door in the north gable end. At the apex of the gable at the north end is a

decorative finial, a detail that was subsequently picked up in most of the other quarantine greenhouses.

Quarantine Headhouse and Greenhouses #1, #2, #3: Buildings 27, 28, 29, 30, 31

The Building 27-31 cluster consists of a structure that functions as a headhouse (Buildings 27/30) and three attached greenhouses, originally known as Quarantine Greenhouses #1, #2, and #3 (Buildings 28, 29, 31). Since its construction, it has served as the center of greenhouse plant quarantine operations at the Glenn Dale station. Half of this complex was constructed in the early 1930s, the other section not until 1949-58.

Building 27, constructed in 1934, functioned both as the plant quarantine office and as the headhouse for the quarantine greenhouses -- Building 28 (built in 1930) and Building 29 (built in 1934). It is a one-story, concrete-block building with a pitched roof that is consistent with the predominant "cottage style" characteristic of the 1930s-era buildings on the site. It was designed by Frederick Bradford [see "Proposed Detention Headhouse"]. The 1934 work on this building complex may be an example of W.P.A. work at the Glenn Dale site.⁸

Building 28, Quarantine Greenhouse #1, was the first structure built in this complex, in 1930. It measures 3,024 square feet. Building 29, built in 1934, is essentially identical, containing the same square footage. Architecturally these greenhouses, cypress wood-frame houses on concrete footers, were distinctive in their original design because they served as quarantine greenhouses. The specific requirements of plant quarantine dictated that each area of the house be compartmentalized to prevent the transfer of pests or diseases. Each house contained a side aisle for circulation; Building 28 had an aisle along the east side of the building, Building 29 an aisle running along the west side. Entry to the area containing the plants required passing through a series of double doors, with the innermost doors covered in 30-mesh screening. With modern pesticides, the need for so many doors was reduced, and some of the ones separating the headhouse from the greenhouse were removed. Fine-mesh screen also lined all the areas opened for ventilation: interior and exterior wall panels of both the plant area and the side aisle, and the ridge of the greenhouse gable. The armatures used to push the glass panels open were covered in material to prevent the entry of any pests through the roof ridge. Timer-operated lighting systems enabled scientists to extend the daylight exposure time for plants. The rear, or northernmost, compartment of Building 28 features bars on the end wall, because of the additional security required for containing the precious bonsai plants during their quarantine in 1975.

Historically, these greenhouses represent what was most unique and valuable about the Glenn Dale station: its role as the center of plant quarantine activities for the entire Department of Agriculture.

In 1949, Buildings 30 and 31, another headhouse/greenhouse complex consistent with the earlier grouping, were constructed adjacent to these buildings on the east. Building 30 contained both a headhouse area and a separate boiler room. Building 31, known after its construction as Quarantine Greenhouse #3, measured 1,653 square feet. The greenhouse featured cypress-wood framing for the glass panels and a metal interior structural framing system. There was a side aisle running along the

⁸P.W.A. Projects Submitted for Action, June 22, 1935. RG 7, NC-136, Bureau of Entomology and Plant Quarantine, Box 1659, National Archives, College Park Facility. This is the only evidence that has been discovered of public works-sponsored projects at Glenn Dale.

west side of the building, and virtually every section of paneling was covered in fixed mesh-screening and could be opened for ventilation. When it was built, it was considered the most state-of-the-art construction, with timer-operated temperature control, regulating both the radiators and a system by which the vents could be automatically opened or closed. During 1957-58, the building was extended with a section measuring 1,600 square feet at the north side of the building, making the structure roughly equivalent in length to Buildings 28 and 29.

The Cottages: Buildings 32-34

All three of the cottages were designed by an architect named Mr. Betts in the U.S. Department of Agriculture's Office of Public Roads and Rural Engineering, Division of Rural Engineering. There were two designs developed: one five-room residence for the superintendent, named Cottage #1 (Building 32), and a smaller residence used for both Cottage #2 and #3 (Buildings 33 and 34). The cottages were erected on the station property by 1920 [see Figure MD-122-16]. Building 32, identified in the original drawings as "Cottage #1," has been used continuously as a residence since its construction. Cottage #2 (Building 34) is greatly deteriorated and stands vacant, and an arson fire destroyed Cottage #3 (Building 35) in May 1995.

Designed by the Division of Rural Engineering, Building 32 exhibits elements of the Craftsman bungalow, representing the dominant style for smaller houses constructed across the country between 1905 and 1920. Constructed on an exposed concrete foundation, the house features a predominant hipped roof with shed dormers and overhanging eaves. Typical Arts and Crafts-style window configurations of multi-pane sash over one large glass pane, and groupings of multi-pane windows, are found along all four elevations. Three original drawings exist at the Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426; these drawings indicate that the one-story dwelling featured prepared shingles on the roof and shingle siding along its first story and at shed dormers. These drawings also suggest that the house was originally designed to incorporate multiple roof planes (including two front-facing gables), a partial-width projecting front porch along its primary elevation, and center and end chimneys.

Building 32 was designed to function as the Superintendent's house and was the largest of the three cottages constructed when the Glenn Dale Station was first established. David Fairchild, head of the Foreign Seed and Plant Introduction Section signed off on the plans.⁹ Experience at other federal stations indicated that in order to maintain newly introduced seedlings and prepare for sudden changes in weather, it was necessary for several employees to live on the Glenn Dale property. The first superintendent to occupy Cottage #1 was David A. Bisset. Bisset had previously been the assistant in charge of the Brooksville, Florida, field station. Edward Goucher, a plant propagator who had earlier been a part of the scientific staff at the department headquarters in Washington, D.C., was another employee who lived on the station. Second in command under Bisset, Goucher became Superintendent in 1924, when Bisset transferred to the federal plant introduction station in Savannah,

⁹The plans, dated November 28, 1919, are located at the Facilities and Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Georgia.¹⁰ Goucher had lived on the station in one of the secondary cottages and moved to Cottage #1 when he became Superintendent.¹¹ Though a number of persons who lived in the house were responsible for certain plant introductions during their tenures, the most notable superintendent to inhabit Cottage #1 was, in all likelihood, Frederick Bradford. As stated previously, Bradford, who resided at Glenn Dale during the 1950s, supervised a portion of the U.S. National Arboretum's breeding program that established the Bradford Pear as one of America's foremost ornamental trees.

Building 34 was the second of the three cottages constructed at the Glenn Dale Station between 1919 and 1920. Identified in the original drawings as "Cottage #2," Building 34 is similar in design to Building 32 (Cottage #1) and was also used continuously as a residence until approximately 1984. Building 34 was designed to house the Assistant to the Superintendent at Glenn Dale. As noted above, Building 34 is in poor condition and remains vacant.

Designed in 1919 by the U.S. Department of Agriculture, Office of Public Roads and Rural Engineering, Division of Rural Engineering, Building 34 exhibits elements of the Craftsman bungalow prevalent during this period. Constructed on an exposed rough-cast concrete block foundation, the small residence features a double gable roof at its primary elevation, shed dormers on the east and west, pronounced overhanging eaves, and a center chimney. The front double gables feature louvered vents and projecting eaves. Original drawings indicate that a partial-width projecting porch was featured along the building's primary elevation. The porch is currently enclosed. Other elements exhibited on the house that are typical of Craftsman design and construction include multi-pane sash over one large glass pane, and groupings of multi-pane windows along all four elevations. Similar to Building 32, this one-story residence also featured a prepared shingled roof and shingle siding along its first story and shed dormers. Despite the fact that Building 34 is no longer used as a residence, and has not been for over ten years, the building still clearly reads as a residential dwelling and retains the features that characterize it as Craftsman.

When the three cottages were erected at the Glenn Dale Station, following the end of World War I, construction materials and labor were very expensive. As a consequence, although it was planned to heat the houses with hot water, less costly hot air furnaces were installed instead as a temporary measure. By 1925, prices were such that the Superintendent's cottage (Building 32) could be

¹⁰Information from *Plant Immigrants*, No. 183, July 1921. *Plant Immigrants* was the Bulletin of the Foreign Plant Introduction section in the Bureau of Plant Industry, U.S. Department of Agriculture.

¹¹"RMcK" [Plant Introducer, Bureau of Plant Industry] to Edward Goucher [Superintendent of Glenn Dale], March 22, 1924. The letter indicated that Robert A. Worley, a clerk at Glenn Dale, could occupy the house vacated by Goucher when he moved to Cottage #1, and that John W. Mullican, a gardner at Glenn Dale, could continue to live in the cottage he then currently occupied. RG 54, Entry 135F, Box 5. In 1922, Mullican owned a Holstein cow, which he kept on the Glenn Dale station at his cottage and which supplied milk to many of the workers at the station and their children. The cow was tested for tuberculosis and destroyed, and subsequently no animals were allowed on the station except those directly related to the work at Glenn Dale. David Bisset [Superintendent, Glenn Dale] to James B. George [Live Stock Sanitary Section, Maryland State Board of Agriculture], September 27, 1922. RG 54, Entry 135F, Box 3.

equipped with hot water heating.¹²

[Buildings 35, 36; see Pumphouses: Building 18]

Quarantine Screenhouse: Building 38

Building 38 was the center structure of three identical quarantine screenhouses, erected in 1932. It is today the only one remaining. The house is a large wood-frame screened structure with a glass-pane gable roof. It is accessed by a small gabled screen porch entrance on the north side, which features fine-mesh screened doors. The footers for the other two demolished screenhouses are still extant. The whole area is enclosed by a chainlink fence. Located at a distance from the other Glenn Dale plant activities, this screenhouse and the others that flanked it were used for long-term testing of new plants. Typically, some fruit trees were grown for several years before it could be determined whether they could safely be released. The middle screenhouse (Building 38) was the only one of the three originally constructed without a glass roof. In 1934, in a letter laying the groundwork for roofing the house with glass in the future, a horticulturist at the station explained, "we find that we have not been successful in securing good growth in this middle house, even apples and pears refusing to make sufficient growth in one year to provide us with scion wood [cuttings]. We also find that the [screen]house does not dry out quickly following a rain and we fear that we will have trouble in controlling fungous diseases."¹³ Building 38 was the site of quarantine in 1975 for the priceless collection of Japanese bonsai trees given to the United States on the occasion of the U.S. Bicentennial. Today these trees are located at the National Arboretum.

Plant Washing Building: Building 41

Constructed in 1939, this low-lying cinderblock structure is called the Plant Washing Building on the site plan. The single, subterranean interior room has been used in recent years to store plants in the winter. It is located at a distance from the center of the station's plant introduction activities.

Storage and Implement Shelter: Building 42

This simple, one-story, wood-frame shed was constructed in 1923 as part of the complex of barn buildings concentrated just to the south of the main Glenn Dale station activities. It is rectangular in plan, stretching east-west, with the primary entrance on the west end of the building. The shed is faced with clapboard siding (painted red with white trim) and has a series of irregularly spaced windows and doors on its north and south facades. Wide horizontal clapboard double doors on the western facade provided access for storing equipment. The shed was initially referred to as a nursery stock storage shed and appears to have been used as an auxiliary packing center during the big spring shipments. Designed by an architect named Mr. Betts of the Department of Agriculture's Bureau of

¹²"Memorandum Regarding the Matter of Equipping the Superintendent's Cottage with a Hot Water Heating Plant," no date [ca. 1924-25]. RG 54, Entry 135F, Box 5.

¹³W.E. Whitehouse [Horticulturist, Glenn Dale] to Benjamin Morrison [Bureau of Plant Industry], January 10, 1934. RG 54, Entry 135F, Box 69.

Rural Engineering for the fledgling Plant Introduction Station, the structure was originally covered with a slag roofing called "Barrett Specification Type AA Roof."¹⁴ The low-gable roof collapsed during the winter 1995-96.

Building 43

Situated along the eastern property edge of the Glenn Dale site, Building 43 is a simple, one-story, L-shaped shed built to house farm equipment. The wood-frame shed is part of the complex of barn buildings just to the south of the main concentration of buildings at the station. The longer leg of the L-shape was constructed in 1924, and the small extension perpendicular to the original shed on its northern end was added in 1929. Like the other sheds in the complex, this building is faced with clapboard siding painted red with white trim. It has a gable roof, which is deteriorating. The shed is divided into a series of stalls, each with a set of double doors. According to Dr. William Ackerman, who was in charge of the Glenn Dale station from 1959 to 1974, this shed was gradually abandoned, because its stalls could no longer accommodate the width of newer farm equipment.¹⁵

Building 44

The largest structure and the only two-story building at the Glenn Dale station, this traditional barn is the center of a complex of related barn buildings built in the earliest years of the Plant Introduction Garden. Building 44 was constructed in 1920 to shelter horses and other equipment. The rectangular building is faced with horizontal clapboard siding (painted red with white trim). Large sliding double doors, supported by intricate hardware, provide access to the interior of the barn from both east and west. On the north facade, three six-over-six windows provide light to the first floor, while two identical windows on the second floor, or loft level, flank a set of double doors. A large lean-to was added to the southern facade in 1924. It attaches to the main building immediately below the sills of the second-floor windows. Doors on the east, south, and west sides of the lean-to are interspersed with six windows. Each window on the lean-to is comprised of only six panes, half the size of the windows on the main barn building. The lean-to roof has collapsed on the western end of the structure and several panes of glass are broken or missing. Although the original plans have not been located, it seems likely that the building was constructed by the Department of Agriculture's Department of Rural Engineering, which designed Glenn Dale's Building 20 in a similar style.¹⁶ The building is still used in a limited way for its original purpose, the storage of farm equipment.

Building 44 was one of the first structures of the station. Subsequent sheds that were constructed in the surrounding area followed the stylistic precedent established by Building 44. Along with the residence cottages, greenhouses, and a headhouse, the barn building provided an obvious support

¹⁴David A. Bisset [Superintendent, Glenn Dale] to Joe L. Mahoney [Bureau of Plant Industry? no title specified], September 20, 1922. RG 54, Entry 135F, Box 3.

¹⁵Oral interview with Dr. William Ackerman, June 9, 1995. He stated that one could drive into the stall but then could not open the vehicle doors.

¹⁶Drawing for Building 20, signed by the Division of Rural Engineering, is located at BARC, Building 426.

function to the daily operations of the federal plant introduction garden.

Buildings 46 and 47: U.S. National Arboretum Operations

In 1991, a 1,200 square foot prefabricated metal building (Building 46) was erected to store equipment and supplies for the Woody Landscape Plant Germplasm Repository of the U.S. National Arboretum. During the summer of 1993, a 600 square foot trailer (Building 47) was located adjacent to Building 46 to serve as an office for the repository. Two unheated Quonset Hut-style temporary growing shelters (Buildings 50, 52) were installed in a location near the office trailer to provide winter protection for the young plants.

Other [Demolished] Buildings

There are a few buildings that have been demolished at Glenn Dale, in addition to Cottage #3 (Building 33), which was destroyed by fire in May 1995. Building 19 was a large lathe screenhouse, erected in 1927, and measuring 3,000 square feet. It was the site of much of Dr. William Ackerman's historic camellia breeding program. Building 40 was a small lathe house that contained materials for other structures. Building 45 was a low-lying wooden shed located close to the entrance to the fields; it is the site of a brand new state-of-the-art hazardous materials storage building, completed in 1996.

Description: Landscape Elements

The site is "L"-shaped, encompassing 70 acres. The long leg of the "L," which runs in a north-south direction, comprises the first 50 acres purchased by the government in 1919. This area, generally flat and cleared of natural growth, consists of the principal nursery plots. It was divided into four sections, A B C and D, which ran in a north-south direction from east to west. The buildings of the station were clustered together in the northernmost area of the property, in a small 12-acre section. The short leg of the "L," totalling 20 acres, runs in an east-west direction at the southern end of the 50-acre plot; it was leased in 1930 and purchased in 1940. The acreage directly south of the 50-acre parcel rises slightly before dropping again at the property line, creating an area referred to as Watson's Hill. Watson's Hill, covered in a large pile of brush and other plant material, has been used by the station as the dump for plantings that are no longer needed. As the property proceeds to the east, it crosses Lottsford Branch, which runs through a wooded gulch/gulley area. These five acres by Lottsford Branch were never developed for use in propagation or experimental plots.

Around the Buildings: Northern Section

The 12-acre area at the northernmost end of the property where the buildings are clustered together was addressed in Historic American Engineering Record No. MD-122, to which this is an amendment [Robinson & Associates, *U.S. Plant Introduction Station, Glenn Dale, Maryland*, January 1997]. Notable landscape features in this section include the pond at the northwest corner, the entrances to and road systems of the station, and the ornamental plantings around the buildings and along the perimeter of the property.

The pond was created early in the history of the station; on the first site visit in 1919, when the heads of the department were first examining land in the Bell area, they noted the "living stream" at the northwest corner of this property. It seems likely that, soon after acquiring the land, scientists at the station created the pond to be fed by the stream.

There are four distinct entrances to the station. Only two are in use today. The westernmost entrance, which served as the principal entrance to the station for many years, has not been in use for close to the last decade; located at the northwestern corner of the property, it provides the first view of the station when approaching from Glenn Dale Road. This entrance road, which runs east-west across the north section of the station and creates a divider line between the fields and the cluster of buildings, is enhanced by two rows of Bradford Pears. These trees were planted in the early 1960s by Dr. William Ackerman when he was superintendent, to create a formal approach into the station.¹ The three remaining entrances are all located along the northern boundary of the station, along Old Pond Drive parallel to the old Washington, Baltimore & Annapolis railroad bed. Two of these entrances in use today are located at either end of the bank of quarantine greenhouses. The one at the western end of the greenhouses opens onto a small parking lot and a road leading to the east-west road that borders the fields. The entrance at the eastern end of the greenhouses accesses a service road that leads past

¹Interview with Dr. William Ackerman, conducted by Heather Ewing of Robinson & Associates, Inc., at Glenn Dale, October 30, 1996.

the Main Office (Buildings 1, 2, 3) to the beginning of the fields. There is yet another entrance along this north boundary line, at its easternmost end, which leads past the superintendent's cottage (Building 32) to the edge of the fields; although the house is still lived in, this entrance is no longer used. Although some of these entrances are now closed, the circulation pattern of this northern section of the station remains essentially unchanged from the station's circulation pattern during the height of its period of significance in the 1930s.

The ornamental plantings that surround the buildings are located in four distinct plots, which were named P1, P2, P3, and P4, moving east to west across the north end of the station. Some of the more significant individual specimens extant on the Glenn Dale site are described below [further discussion of the original plantings of this area can be found in the historic context section of this addendum]. They include the Dawn Redwood tree, an example of which is located near Cottage #2 (Building 34). This species was thought to have been extinct for over seven million years until a Chinese forester discovered a single *Metasequoia* in a temple in the remote Szechuan village of Mo-Tao-Chi. The specimen at Glenn Dale was presented in 1948, the result of an expedition that traveled down the Yangtze River and across three mountain ranges to retrieve the seeds.

Still extant in a spot to the the west (or rear) of Building 3 is an enormous flowering cherry, of the variety Higan Cherry, which was received as budwood in 1917 by plant explorer David Fairchild, the head of the Foreign Plant Introduction department at the Department of Agriculture. It is believed to be one of the largest specimens of its kind in the United States. Near Cottage #1 (Building 32) is another large Japanese flowering cherry tree, which was transplanted to Glenn Dale in 1926 from Fairchild's Chevy Chase home, "In the Woods." The extant ornamental cherries near Cottage #1 formed part of an orchard of cherries planted in the first years of the station as a beautification measure along the perimeter of the property.

Along the road leading to Cottages #2 and #3 (Buildings 34 and 33 respectively) is a line of conifers, established from trees introduced by renowned plant explorer Frank N. Meyer. Meyer spent thirteen years (1905-1918) in China, Manchuria, Korea, Siberia, Turkestan, and the Caucasus, collecting over 2,000 species and varieties of plants. He disappeared in 1918 from a steamer on the Yangtze River. These trees are the oldest recorded permanent plantings at Glenn Dale, and the original specimens for these trees were sent from Northern China by Meyer in 1906.²

²Much of the above on plantings at Glenn Dale came from Jan Bowman, *Ghosts of Glenn Dale Past: The History and Folklore of Several Permanent Plantings at the National Plant Germplasm Quarantine Laboratory, Glenn Dale, Maryland*, private printing, May 1, 1990. Since her publication, a large percentage of the specimens that were extant in 1990 reached the end of their lifespan, died because of storms or harsh weather, or were removed. A good example is the Pat Nixon Rose, which was presented as a gift to the wife of then-President Nixon. Placed in quarantine at Glenn Dale upon its arrival in the United States, the plant -- when it was finally released -- could not be accepted, since the Nixons had left the White House. It was never distributed. Glenn Dale maintained the rose, which is believed to have been the only planting of its kind, until recently in a permanent planting alongside Building 3. It is no longer extant.

The Fields: A, B, C, and D

The fields run north-south the length of most of the property. They are divided into four separate sections, labeled A B C and D. Each lettered section is divided into subsections, which have been numbered. The original numbering system, in use for most of the history of the station, ran from 1 to 5, beginning A1 for example at the level south of the barn cluster, and B1, C1, and D1, at the line created by the road that runs east-west south of the cottages and Building 20. As mentioned above, the area north of this road, occupied by the buildings and ornamental plantings, was divided into four sections referred to as P1, P2, P3, and P4. The National Arboretum in their use of the site has omitted reference to these P numbers, creating instead a system that labels A1 through E1 at the north end of the station -- encompassing all the buildings (A1 through D1) and the pond (E1). Beginning at the fields, the sections are labeled A2 through D2, continuing through to A6, B6, etc. At the southernmost end of the property, Watson's Hill is referred to as A7, a small planting area between the hill and the woods is named B7, and the woodlands at the southwest corner of the station are referred to as C7.

The circulation pattern of the fields at the Glenn Dale station has remained essentially unchanged throughout the history of the station's operations. They are accessed by two principal drives, which run parallel to one another in a north-south direction. At the middle of the fields, in between plots B and C, is a drive that runs two-thirds of the way south through the fields before turning east to join the other principal road. The road farther to the east, located between plots A and B, runs the length of the station. Apparent from aerial photographs is an additional road that ran along the easternmost boundary line, no longer extant. There was also a small road that extended along the southern border of the original 50 acres, west from the central road that ran the length of the property; while the bed of this road is still clear of plantings, it is not as distinct a road as the others of the station. Likewise, there appear on the aerial photographs to be two small roads that extend into the Watson's Hill section of the station; these also remain open beds today, but are not distinct roads such as visible elsewhere on the station.

Plantings were rotated frequently, as different experiments were conducted at different times in the history of the station. The general disposition and use of fields, however, is still clearly legible, as the National Arboretum (the current occupant) has planted out the fields in a similar fashion. There are a number of large ornamental trees that are remnants of earlier experiments, still standing in the fields.

At the entrance to the fields, to the west of the road that runs down the middle of the station is an ornamental pistachio tree, brought by Dr. Ackerman from the plant introduction station in Chico, California. Ackerman had been doing experimental work there prior to his tenure at Glenn Dale. There is a cluster of large trees, none of which has a particularly distinguished history, around Building 41. By the quarantine screenhouse (Building 38), near the entrance road that leads from the northwest corner of the station, there is a large chestnut tree. Halfway down the station property, in the middle of the fields, is a cluster of large trees, including a sawtooth oak and a Zelkova Schneideriana. The sawtooth oak is the daughter of the original sawtooth oak that was located in front of Building 1 in a permanent planting (P2); the original came down in the mid-1990s and the enormous tree stump is still extant. At the rear of the station's original 50-acre parcel, at the foot of the Watson's Hill area, is a large tree related to the Turkish Filbert, at the corner of what represented the nut block; the only specimen still standing from the use of this area as an orchard, it is thought to

be the largest specimen of its kind in the United States.³

The Woods

At the southwestern corner of the property is a sloping wooded area. Amidst this natural growth, the scientists of Glenn Dale conducted experiments on certain woody ornamentals, especially the Glenn Dale azalea work undertaken by B.Y. Morrison and continued by others, and also work on rhododendrons collected in Japan. There is still much evidence of azaleas and rhododendrons in the woods. The section of woodlands at the western perimeter is part of the original 50-acre parcel; the rest of the woods falls into the 20 acres that were leased in 1930 and purchased in 1940. A winding path through the woods is still extant today. It is lined with azalea bushes and rhododendrons.

Today, the main road concludes at the foot of Watson's Hill, at the perimeter of the original orchard blocks. As mentioned above, it is apparent from aerial photographs of the 1930s, when more of this 20-acre south section was used for plantings, additional circulation systems existed at this end of the station. A road ran west to the edge of the woodlands at this point, and additional roads led in a eastward curve up over the hill to the rear amphitheatre-like planting area. Open beds in these locations today give evidence of the original road paths.

Watson's Hill: Southern Section

The southern section of the station, which runs east-west and comprises approximately 20 acres, was leased in 1930 and purchased in 1940. The most dramatic feature of this section of the station is the large hill, called Watson's Hill, that rises from the fields. Watson's Hill gained its name from the name of the man who owned the land in 1919, when the government began its operations on the original (adjacent) 50-acre parcel. This hill has been used as a dumping ground by the Glenn Dale scientists, where specimens from abandoned or completed experiments are discarded when the fields are prepared for new work. Given the small acreage of the station, it was not possible to leave old experiments in the fields; the land was constantly reused for new work. At the rear or south side of Watson's Hill, the land slopes down quickly to the property line, creating a small amphitheatre-shaped area. In aerial photographs from the 1930s, it is apparent that this area was planted out; it does not appear to have been used in recent years and contains a scattered sampling of orchard trees.

As the property continues to the west, it extends over Lottsford Branch, dropping precipitously into a densely wooded area. Dr. Ackerman suggested that there were at one time plans to develop a method by which the area could have been used for plantings -- a project that would have included building a bridge -- but this idea was never carried out.⁴ Principally this area was used by the station as a non-

³Site visit/oral interview with Drs. Ackerman and Waterworth, conducted by Heather Ewing of Robinson & Associates, Inc., October 30, 1996.

⁴Dr. William Ackerman, site visit/oral interview with Heather Ewing, Robinson & Associates, October 30, 1996.

plant materials dump. It has been cleared of all refuse in recent years.⁵ This area constitutes approximately five acres, virtually the only area of the station not developed for use in conjunction with the efforts of plant introduction and quarantine.

⁵Dr. Howard Waterworth, site visit/oral interview, October 30, 1996.

II. THE CONTEXT OF FEDERAL PLANT INTRODUCTION IN THE UNITED STATES: THE GLENN DALE STATION'S SIGNIFICANT ROLE

Most of the agricultural crops grown today in the United States were derived from foreign plants introduced by early settlers or were indigenous and utilized by the Native Americans several centuries ago. The Agriculture section of the Patent Office (established in 1839) first handled some of the plant introduction activities for the U.S. government. In 1862 when the Agriculture Department was created, these functions were centered in the Department's Division of Gardens and Grounds, and the Division of Seeds, created in 1862 and 1868, respectively. It was not until 1898, however, that a formal plant and seed introduction program was established. The expansion of American agriculture westward into areas with new soils and temperatures heightened the benefits of a national plant introduction program.

History of Plant Introduction in the United States

The definition of plant introduction, while it can refer specifically to the actual release of plant materials for public or commercial use, generally encompasses the transfer of living plant materials from one location, where the plant has presumably existed for an extended period, to a new location.¹ Most of the major plants and crops in the United States are of foreign origins. While blueberries, cranberries, pecans, sunflowers, and tobacco were originally present in the United States, the "native" crops we think of such as corn, beans, wheat, tobacco, and cotton were all introduced from areas outside the United States. Before and after the American Revolution, seeds and plants were brought into the country through a variety of ways: immigrants, traders, government officials, and privately sponsored expeditions. There was, however, no organized system of seed distribution or experimentation.² In the 1780s and 1790s agricultural societies were formed in South Carolina, Pennsylvania, New York, and Massachusetts, for the purpose of experimentation and the dissemination of results.³ By the early nineteenth century, as the country expanded and included new and diverse climates and terrains, it was recognized that the introduction of plants from other countries was necessary for the full development, or cropping potential, of the entire United States.

Government Involvement in Plant Introduction

Thomas Jefferson wrote that "the greatest service which can be rendered any country is to add a useful plant to its culture." Although Washington, Jefferson, and other prominent statesmen advocated agricultural research programs from an early date, very little government action was taken before the middle of the nineteenth century. Plant introduction was essentially limited to individually sponsored

¹Howard L. Hyland, "History of Plant Introduction in the United States," *Plant Genetic Resources: A Conservation Imperative*, p. 5.

²Hyland, p. 6.

³Alfred C. True, *A History of Agricultural Experimentation and Research in the United States, 1607-1925*, p. 7.

efforts. The first official organization of plant introduction efforts came in 1827 when John Quincy Adams issued a circular requesting U.S. consular officers abroad to send home any seeds and plants that might "give promise ... of flourishing and becoming useful."⁴ In 1839 Congress appropriated \$1,000 for seed distribution and the dissemination of plant information by the Agricultural Section of the Patent Office. With this appropriation others soon followed, enabling further research and the establishment of a garden on the Mall in Washington, D.C., for experimentation of new crops. In 1858 the Commissioner of Patents hired his first plant explorer, Robert Fortune, to go to China to collect tea seed.⁵

When Abraham Lincoln established the Department of Agriculture in 1862 during the Civil War, plant introduction and seed distribution were recognized as a critical part of its mission. Isaac Newton, who had served as chief of the Agriculture Section in the Patent Office, was appointed in 1862 as the first commissioner of the new department, a post he held until his death in 1867. In addition to the collection and distribution of seeds, the department answered inquiries; disseminated statistical and other information; tested new implements, cereals, seeds, and plants; performed chemical analysis of soils, grains, fruits, plants, vegetables, and manure; published results; and sought to establish professorships in botany and entomology, as well as an agricultural library and museum.⁶

At the turn of the century, the head of the Department of Agriculture was recognized as a Cabinet-level position.⁷ James Wilson, appointed the first Secretary in 1898, was particularly connected to the endeavors of plant research and introduction. He immediately established the Section of Seed and Plant Introduction, the first formal plant introduction program. In that same year, the first Federal Plant Introduction Garden, now known as the Subtropical Horticulture Research Station, was established in Miami, Florida.

The Department of Agriculture's Office of Foreign Seed and Plant Introduction, and the Creation of the Four Federal Plant Introduction Gardens⁸

Together with the organized collecting of plants abroad, the Department of Agriculture recognized that it was necessary to establish facilities in the United States for the testing and propagation of these plants prior to their distribution throughout the United States. Consequently, in 1898, the Federal Plant Introduction Garden was created in Miami, Florida. In 1904 the second station was established in Chico, California, focusing on introductions in a western climate. The need for a station near the Department of Agriculture's headquarters and inspection house resulted in the establishment of the

⁴W.H. Hodge, C.O. Erlanson, "Federal Plant Introduction: A Review," *Economic Botany*, p. 303.

⁵Hyland, p. 7.

⁶True, p. 41.

⁷Hodge and Erlanson, "Federal Plant Introduction: A Review," p. 301.

⁸Material in the following paragraphs comes from Hodge, Loomis, Joley, and Creech, "Federal Plant Introduction Gardens," *National Horticultural Magazine*, April 1956, pp. 86-106.

Glenn Dale station in 1919. In this same year the Barbour Lathrop station was founded in Savannah, Georgia, the final and smallest of all the four stations, primarily to support research on bamboo.

Work at these four stations was carried out in conjunction with the state agricultural stations and with private individuals. As members of the Plant Introduction Section explained in a 1956 article on the Federal Plant Introduction Gardens:

The Introduction Gardens have been called the "Ellis Islands" of immigrant plants. They simply receive introduced plants, quarantine them if necessary (primarily at Glenn Dale), test them to see if they are in any way suitable for more extensive trial among America's plant scientists, and, if so, are increased and distributed, based on the orders of specialists at the headquarters of the Plant Introduction Section. To the Introduction Gardens go plants to be quarantined, woody species which cannot be handled as annual crops, certain types of ornamentals, and all little-known plants the potentialities of which are yet to be determined. Some introductions may even need to be grown to maturity to allow their correct names to be determined or verified. Introduced seeds or propagules of most of our common annual field and vegetable crops do not normally go to these Gardens but rather enter test programs in the United States through another series of regional plant introduction centers administered cooperatively by the Department with the State Agricultural Experiment Stations.⁹

In 1898, the United States found itself at the end of the Spanish-American War with new tropical possessions, about which they knew little. The first activities of the newly established Office of Foreign Plant Introduction were directly related to the study of tropical plants and their introduction.¹⁰ The first Federal Plant Introduction Garden in Miami was a small six-acre site, soon supplanted by a site at Buena Vista, north of Miami. By 1923, the plants had been established at Chapman Field, a World War I Army aviation base near Coconut Grove. The station today is known as the Subtropical Horticulture Research Station; along with Glenn Dale it is the only other federal station remaining. Whereas the original Miami site was concerned primarily with studies of tropical woody plant introductions, the Coconut Grove station has propagated seedlings received from every part of the subtropical and tropical world. The introduction of Indian and Philippine varieties of mangoes, and avocados from Mexico and Central America, have contributed to the development of extensive U.S. commercial plantings of these fruits.

In 1903, the Section of Seed and Plant Introduction was placed under the Bureau of Plant Industry, a new division that unified all aspects of plant research in the Department of Agriculture. A year later, the second federal plant introduction garden was founded in Chico, California. This Sacramento Valley station focused specifically on testing, propagating, and distributing specimens under West Coast conditions. The original 80 acres donated by the citizens of Chico was enlarged to 210 acres with the acquisition of neighboring properties. By the 1950s, Chico was the center of introductions of

⁹Hodge, "Federal Plant Introduction Gardens," p. 87.

¹⁰Knowles A. Ryerson, p. 122.

deciduous stone fruits and nuts. Extensive tests were conducted over a series of years on several hundred varieties of foreign cherries, apricots, peaches, and nectarines; experiments were also made on 750 introductions to find a nematode-resistant rootstock pistachio nut tree. Eventually three types were passed on as good enough for trial elsewhere. During these years the Glenn Dale station held all stone fruits entering the country before sending them on to Chico for evaluation. The Chico station closed in 1973.

In 1919, the U.S. Plant Introduction Garden (later called the U.S. Plant Introduction Station) and the Barbour Lathrop Plant Introduction Garden near Savannah, Georgia (which closed in 1981) were created. The Savannah station was established on the site of an enormous grove of bamboo, which was saved from destruction by Barbour Lathrop, a world traveler from Chicago who purchased the stand at the behest of David Fairchild and gave it to the government. The bamboo originated from Japanese plants introduced to the area in the early 1880s. Once the garden was established, virtually all bamboo was transferred to Savannah, creating the largest living collection of hardy bamboo extant. Research on the possible industrial applications of bamboo, as well as the testing of other unrelated ornamental plants of interest to the South, was carried out at the station until its closure.

The Development of the Glenn Dale Station (1919-1920)

The Garden at Yarrow, Maryland

The impetus for creation of the Glenn Dale station -- an approximately 50-acre site in the vicinity of Washington, D.C. -- found its origins in the work carried out by the Office of Foreign Seed and Plant Introduction in the Inspection House and detention greenhouses located on the Department grounds in downtown Washington, D.C., and in the operations of a 40-acre garden at Yarrow, Maryland. The Yarrow garden had been established [in the 1910s] on land supplied to the department by a Mr. Lee Hunt. Hunt was a personal friend of David Fairchild; Fairchild, head of the Office of Foreign Seed and Plant Introduction since its establishment in 1898, was one of the critical minds behind the development of the plant introduction system.¹¹ Work was conducted at Yarrow until 1918, when conditions became less favorable for an unnamed reason.

At that time, Beverly T. Galloway sought a Congressional appropriation to establish a new garden, in a "location with good tractible soil as well located as possible for our detention and propagation work."¹² A team of men from the department explored properties in Fairfax, Virginia; College Park, Maryland; near the Soldier's Home, in Washington, D.C.; and at a location some 16 miles northeast of

¹¹P.H. Dorsett, "Report on the Establishment of the Bell Station (1919-23)." National Archives and Records Administration (NARA), Record Group (RG) 54, Entry 135F, Box 29.

¹²Dorsett, "Report on the Establishment of Bell Station (1919-23)," notes from July 25, 1919. Galloway had begun his long and distinguished career with the U.S. Department of Agriculture at age 24, in the Division of Botany. Within a year, because of senior retirement, Galloway was appointed head of the Section of Mycology. Over a short period of time, he attracted numerous young scientists, including David Fairchild, P.H. Dorsett, and others, to the U.S.D.A. All of these men went on to play critical roles in the development of plant pathology in the United States. When the Bureau of Plant Industry was created in 1901, Galloway was appointed its chief.

Washington called Bell.

Bell, Maryland

The department was drawn to Bell, Maryland, principally because of one of its residents, Dr. Walter Van Fleet, an Agriculture Department employee in the Office of Horticultural Investigations. Galloway visited Van Fleet on May 29, 1918, intent on securing information on the propagation of nursery stock, the effect of the restrictions of the War Trade Board and the Federal Horticultural Board on importations, and general information on growing. World War I had proved to be a test for the plant introduction system, posing critical challenges both to increase food production and to save crops from disease.¹³

The plant introduction system of the Office of Foreign Seed and Plant Introduction was undergoing a great expansion at the close of World War I. One of the earliest stations established in the system, at Chico, California, in 1904, acquired 130 additional acres in 1917, expanding its land from 80 to 210 acres. The office acquired a new station in Savannah, Georgia, in 1919, dedicated principally to research on bamboo, the gift of Barber Lathrop. The small six-acre station that had been the first creation of the federal plant introduction system in 1898 at a site in Miami, Florida, and later moved to Buena Vista, north of Miami, was moved in 1922 to Chapman Field, a large World War I aviation base near Coconut Grove.

A station in close proximity to Washington was the goal of the Department. The land that Galloway visited at Bell, Maryland, was conveniently located along the Washington-Baltimore-Annapolis trolley line, at the Bell Station stop. Leasing a four-acre plot from a local farmer, the Department had been conducting experiments in the Bell area since about 1912 or 1913. Van Fleet, in addition to managing this work, had been growing test plots on his own farmland as well.

On the leased land, Van Fleet had created a test orchard of Chinese hairy chestnuts in 1913. Between 1906 and 1914 the Office of Foreign Seed and Plant Introduction had imported large numbers of these chestnuts, sent by plant explorer Frank Meyer, who found them in northeast China. Nearly half of the plantings in Bell (some 1,400 seedlings) were hybrids made by Van Fleet in an effort to secure a blight-resistant type.¹⁴ Attractive to the men determining the new station's location was the fact that Van Fleet's chestnuts were located less than one-half mile from an old stand of chestnuts severely infected with blight, and thus "had unusual opportunities for infection."¹⁵ The product of Van Fleet's work was considered by the department as one of the most promising trees to combat disease at that time (an opinion that was later altered); the specimen was also being tested for nut production, and for its tannin production possibilities. Interest in the native chestnut had been spurred by the concerns in the tannin industry, nearly 50 percent of the material for which was supplied by the chestnut.

¹³B.T. Galloway, "Plant Pathology," *Agricultural History*, Vol. II, No. 2, April 1928.

¹⁴B.T. Galloway, "Chinese Hairy Chestnut (*Castanea Mollissima* Blume)," *Plant Immigrant*, No. 211, November 1923, pp. 1934-36.

¹⁵Galloway, "Notes, Observations," May 29, 1918, p. 207.

After the visit, Galloway submitted a report to David Fairchild with a plan for establishing a plant introduction garden system. The report concluded:

The dominant idea in these suggestions is that we need places where men of right temperament, combined with ripe experience and judgement, may without interruption utilize many of our introductions in developing new crop plants. The plan does not presuppose any conflict with existing breeders in the Department or elsewhere. Rather, it would supplement other breeding work. In short, we need plant work shops where the right kind of men may take raw materials in the shape of plant emigrants and in the melting pot of the breeder's garden develop new crop plants, useful alike to American agriculture and horticulture.¹⁶

Van Fleet, known today mostly for his research on roses, epitomized the "right kind of men" to which Galloway referred. Galloway described Van Fleet's work to secure new crop plants as constant, saying "it cannot be regulated by Government time or Government hours." This image of the solitary scientist working on his own plot of land around the clock and through the seasons guided the conception of the plant introduction stations as it had evolved by the late 1910s. In his notes, Galloway had indicated that David Fairchild had first conceived of the idea of "individual plant gardens for men with ability" on a visit to Dr. Van Fleet's residence in early 1917.

It is evident that as the work of the Department goes on, there will from time to time be men of peculiar temperament and ability like Dr. Van Fleet who could do good work provided they are furnished necessary material and equipment. With this object in mind, it would seem proper to consider a plan looking toward the gradual establishment of what might be called Plant Gardens. The dominant idea would be the utilization of plant introductions and other desirable plant material for crop improvement purposes. These gardens would primarily be one man establishments....¹⁷

Van Fleet was the model upon which the plan for the station was developed, and the land in the vicinity of Bell where he worked seemed a natural choice for the site of a plant introduction station near Washington. Galloway noted that:

There is a fine field of red clover across the car track from Doctor Van Fleet. This is on a place belonging to Mr. Wormwood. He is a good farmer and nearly always has fine clover which he cuts for hay and the next year follows with

¹⁶B.T. Galloway to David Fairchild, June 8, 1918. Letter on display in an exhibit on B.T. Galloway and the Bureau of Plant Industry, National Agricultural Library, Special Collections, Fall 1996.

¹⁷B.T. Galloway, "Notes, Observations, Suggestions, and Recommendations relative to Nursery Stock and Some Related Subjects," 1918, p. 217. Bound typescript, Beverly T. Galloway Papers, National Agricultural Library, Special Collections.

potatoes. His rotation is corn, clover, and potatoes. Clover is now in full bloom.¹⁸

During the summer months, Galloway returned to the Bell area with a group from the department, including Fairchild, Van Fleet, Peter Bisset and P.H. Dorsett. They examined a number of properties in the vicinity of Van Fleet's farm, ultimately concluding that Wormwood's acreage was best suited to their plans.

We looked over the Wormwood farm of 96 acres along the Washington Baltimore & Annapolis Rail Road at Bell just to the south of Dr. Van Fleet's. This is the best looking farm and best-kept of any I have seen here or elsewhere. The entire farm is practically cleared and is in a good state of cultivation. Mr. Wormwood has been practicing the rotation of corn, wheat, clover, and potatoes and has his place in good condition. The soil is Norfolk sandy loam. It's slightly rolling and there are a few low and more or less wet areas on it. The place is advertised for \$20,000. The west part of the place would suit our purposes, I think admirably. This in my opinion, all things considered, is the best thing we have seen. This tract is within 1/2 to 3/4 of a mile of the projected slate concrete highway which is supposed to be completed within the next two years.¹⁹

Development of the Property: the Glenn Dale Station in its First Years

The Department of Agriculture purchased the initial 50 acres that comprised the U.S. Plant Introduction Station in 1919 for \$10,000 from John D. and Alice G. Wormwood, comprising the western portion of the 90-acre Wormwood farm. The land had originally been a part of the Marietta farm, and the Wormwoods had acquired the land in 1891.²⁰ The Wormwood house and barn, the only structures on the property, were both located on the eastern section of the land, unaffected by this sale. [This section of the Wormwood farm later became known as the Darrow property.]

In late summer 1919, the team of men from the Department returned to Bell to pace the property and sketch a preliminary layout for the station. The pencil sketch drawn by Dorsett at that time reveals that the essential plans for the use of the land had already been formed by the group, and that many important elements remained through the design process to become part of the station as it was ultimately built.

In the sketch, the buildings are clustered in the northeast corner of the property, with the greenhouses extending south from an east-west-oriented headhouse. Ridge greenhouses are typically erected with the ridges oriented in a north-south direction. In the same cluster area with the headhouse/greenhouses is an office, stable, and storage facility, as well as cottages for the employees. To the west, located

¹⁸Galloway, "Notes, Observations," p. 207.

¹⁹Dorsett, "Report on the Establishment of the Bell Station (1919-23)," p. 25.

²⁰Correspondence from 1925 relating to right-of-ways on the property contains language from the original deeds. Files located in Building 1, Glenn Dale.

off of an entrance to the station is another cottage, approximating the location of the cul-de-sac with residences that was ultimately erected. A few linear roads run parallel to one another in a north-south direction, separating the fields into two large sections, which presumably would have been yet again divided into smaller growing plots. One significant difference between the sketch and what was finally built were the individual laboratory structures scattered around the building area. Following the philosophy articulated by Fairchild and Galloway, these labs were probably intended to enable scientists to carry out their individual research projects in solitude; by the time the buildings were actually constructed, however, this plan appears to have been abandoned or altered, omitting the individual laboratories.

As the construction of the station was begun, the careful consideration of its appearance was foremost in the minds of those shaping it.

The location selected for the new plant detention station at Bell Station, Maryland, lies in such fashion that nearly the whole area of fifty acres may be seen from the Washington, Baltimore & Annapolis Electric Railroad.... The tract is nearly rectangular in shape with the north end abutting on the electric road. From the electric road, and especially from the electric cars in passing, one may get a general view of the entire area. There are no trees or hills of consequence to obstruct the view. All the foregoing facts should be kept in mind in considering the layout of buildings and other equipment.²¹

P.H. Dorsett ran the station in its infancy, overseeing the construction of the buildings and the initial seasons of plantings. As the Glenn Dale station was established, the department rushed to bring everything over from Yarrow. Plantings were undertaken immediately, with many of the specimens transferred from the garden at Yarrow. David Bisset, who had been the Superintendent at one of the regional stations in Brooksville, Florida, was appointed the first Superintendent of the station.

The layout of the station established patterns that remained throughout the history of the site's operations as a plant introduction station. The buildings were clustered together in the northern end of the property, with the fields extending south to the edge of the property line, articulated by several parallel roads. The rear of the station was occupied by the test orchards and an orchard permanent planting or repository for the varieties being tested. A description of the station offered by B.T. Galloway on one of his visits painted a picture of the work of the fledgling station:

At Bell, Maryland, a walk through the greenhouses and nurseries shows even more interesting and striking things. Here in one place are thousands of baby rhododendrons, collected by [plant explorer J.F.] Rock in the high mountains of Yunnan, China.... He describes many of them as growing at very high altitudes and having gorgeous flowers. In a specially made compartment, artificially heated and artificially humidified, so as to imitate the steaming tropics, are many papayas, mangosteens, litchis, and related plants. The litchi and mangosteen are much

²¹Memorandum by B.T. Galloway, "Buildings and Equipment for the New Plant Detention Station, Bell, Maryland: General Conditions," August 18, 1919. NARA, RG 54, Entry 135F, Box 2.

prized fruits of the Orient. We are endeavoring to introduce them into our own tropics. Also, nearby are hundreds of infant chaulmoogra oil trees which furnish the nuts affording an oil used in the treatment of leprosy. These trees will be sent to Hawaii, the Canal Zone, Porto Rico and Cuba. Then there are new avocados from Guatemala, from Ecuador and from other parts of Central and South America, mangos from India and a host of other things. Out in the open air is a block of nearly 7,000 baby chestnut trees from nuts which, less than a year ago, were hanging on the parent trees somewhere in northeastern China. These are the mollissima chestnut and we know that they furnish a fine edible nut and are blight resistant.

As discussed earlier, the work initiated by Van Fleet in the 1910s on the chestnut continued to be one of the principal activities of the fledgling station. Over an acre was devoted to the chestnut trees towards the rear of the station.

One of the first projects undertaken at the station, and one that remained an active interest at Glenn Dale throughout much of its history, involved ornamental pear research. The test nursery was located south of the greenhouses. Initiated in 1919, when Glenn Dale was first opened, the nursery contained many trees that had been grown out one year previously at the Yarrow, Maryland, test nursery. The pear orchard plantings, consisting of two or three different species, were located towards the rear of the station. From the very beginning, the station installed permanent plantings around the buildings, placing single trees or small groups on the lawns about the cottages and greenhouses, in addition to the orchards at the rear of the station; the original Bradford pear specimen was one of these, planted in 1919 in what became known as area P4, located to the west of the parking lot at the northwest of the station [see "Bradford Pear" below]. Most of the pears came from China, where they had been collected by Frank Meyer. These were joined by a number of hybrids made by Van Fleet.

The objectives of the pear plantings were to provide an authentic collection of pear introductions, in order to secure data on the behavior of the trees; to furnish fair-sized trees (with the quarantine regulations more severe, material sent to other gardens had to have been under observation for several years); to obtain data as to the relative value of certain pear species as stocks; to provide propagating material for exchange; and to provide material for breeding work for other branches of the Bureau as well as experiment station workers.

Another of the projects in the earlier years at Glenn Dale was the initiation of a new system of propagation for hardy types of economic bamboos, and the establishment of a permanent collection of bamboo types introduced into the United States. Work had been done at the plant introduction stations in the South, but complications from rust and mite and the inadvertent placement of plants too close together (enabling them to mix) had caused the loss of most of the introductions.

We believe it desirable, therefore, to establish at Bell a small bamboo garden where we can grow and carefully safeguard our more hardy types or the ones in which we are most interested for economic reasons. The space between the greenhouses [Buildings 5 and 6] and Mr. Goucher's cottage [Superintendent's Cottage #1, Building 32] would furnish an admirable place for the garden. It could be made ornamental and by proper planting the entire stretch of glaring

greenhouses and the square ungainly storage building [Building 20] could be screened. ... There are about 40 or 50 hardy bamboos that we should introduce and get established here preparatory to further work on this interesting group of plants. It may be desirable to duplicate our collection at Savannah but there the fact that we can not keep careful watch on our material and be on the look-out for diseases and insects at these outlying gardens makes it desirable to build up our collections here.²²

The work on the station grounds was augmented during these first years by leases with the neighbors for small amounts of acreage on surrounding lands. Through these leases, the scientists at the station gained an additional 30 acres on which to conduct their work.²³ This arrangement between the neighbors and the station apparently continued in an informal way throughout much of the history of the station.

Soon after the establishment of the station, the need arose for a clarification of Glenn Dale's role in the "detention" of plants. The memorandum produced after a conference of various Department officials specified two levels of action: absolute quarantine (which was to remain at the Inspection House on the grounds of the Department of Agriculture headquarters in Washington), and detention, which was to occur at Bell, as the Glenn Dale station was then known. In the time prior to erecting a detention greenhouse at Bell, one end of one of the propagation greenhouses (Buildings 5 and 6) was to be partitioned and used exclusively for detention. An inspector from the Federal Horticultural Board (FHB) arranged to make regular visits to the Glenn Dale station, in order to go over the material in detention. As a result of this memorandum, Edward Goucher, the plant propagator at the Inspection House, was transferred to Glenn Dale "at the earliest practicable date," with all the plant material not held in absolute quarantine; and F.J. Hopkins, at that time located at Glenn Dale, was transferred to the Inspection House to look after the quarantine material, with the Federal Horticultural Board paying half his salary.²⁴ By the mid-1920s, Goucher became the second Superintendent at Glenn Dale, when Bisset moved on to Savannah to direct the Barber Lathrop station.

So many dangerous and destructive crop enemies have been brought into this country that public sentiment has demanded more thorough protection... Cooperating with the Federal Horticultural Board, intensive inspection is made of all seeds and plants coming from foreign countries and all seeds and plants

²²B.T. Galloway, "Notes Made at Bell, Maryland," October 14, 1924. B.T. Galloway Papers, National Agricultural Library, Special Collections.

²³Memorandum, "Summation of Land used by the Bureau of Plant Industry at Bell, Maryland," undated [ca. 1927]. NARA, RG 54, Entry 135F, Box 2. The neighbors leased from included Mrs. Mary Haynes, Bureau of Fisheries; Mrs. Walter Van Fleet; George M. Darrow and Grace E. Darrow; Grover Cleveland Beall and Wm. T. Beall (Wm. W. Anderson, Executor). Mrs. Van Fleet, perhaps out of respect for the contributions her husband had made to the Department and concern for her in her widowhood, was paid \$80 per acre a year, as opposed to the \$20 per acre that the others were compensated.

²⁴Memorandum Regarding Inspection and Detention Work, August 13, 1921. NARA, RG 54, Entry 135F, Box 2.

distributed from our stations but originally coming from abroad. The increase in this work under the Quarantine Order No. 37, issued by the Federal Horticultural Board, has made it necessary to broaden its scope. To this end a new plant detention station is being established near the city of Washington. This station will have for its primary object the receiving and growing of new plant immigrants with a view to removing all possible chances of introducing dangerous diseases and insect enemies.²⁵

As the plants arrived, they were each assigned a plant introduction number, known as a Bell number. In 1922, David Fairchild requested in addition to the numbering system the labelling of plants at all the plant introduction gardens, which "will help the men at the gardens to learn the names of the plants and to know the countries that constitute the source of our material and to become acquainted with the names of our explorers and collaborators.... Numbers mean little to us unless they are connected with the names of the plants, the source of origin, and, whenever practicable, the people responsible for sending them in."²⁶

By the time the station was about five years old, more attention began to be paid to a permanent plantings plan, one that would enhance the area of the buildings at the north end of the station with ornamental plantings. Galloway in a visit to the station described the appearance of the station and a plan for its improvement. The small triangle east of the headhouse was at the time planted with unnamed roses; Galloway found that Superintendent Goucher suggested hugonis for the site, to provide propagating material in the future. To the northwest of the headhouse, Galloway suggested planting a thick screen of phyllostachys bambusoides, which could be taken from the large stands of bamboo located towards the rear of the station; "Mr. Goucher suggests that this will make a fine and picturesque screen shutting off the unsightly coal yard from the front view."²⁷ Northeast of the headhouse, on the west side of the road, he recommended putting a group of three *Ulmus pumila* for specimen plants. In the mid-1920s, there was only a named catalpa at that location, brought originally from Yarrow. Along the east side of the property, where a 75-foot strip had been reserved for permanent plantings, a planting of Japanese cherry trees had been initiated; Galloway indicated that this should be finished, with 19 different cherries then in the nursery to go into this permanent planting. Today, a few of these cherries remain, most notably one brought in 1926 from David Fairchild's Chevy Chase property, "In the Woods."

By the end of the first decade of the station's existence, about 17 acres of land at the northern end of the station was used for "lawns and ornamental plantings of shrubs and trees... [which] adds greatly to the operating expenses of the station. Mr. Morrison is now at work on a new plan of arrangement of this portion of the station grounds in which a large portion of the 17 acres will be converted into cultivated nursery plantings." Another factor propelling the need for the reconsideration of the

²⁵*Annual Report of the Bureau of Plant Industry, Department of Agriculture, for 1919*, p. 23.

²⁶B.T. Galloway to David A. Bisset, September 30, 1922. NARA, RG 54, Entry 135F, Box 3.

²⁷B.T. Galloway, "Notes Made at Bell, Maryland," October 14, 1924. B.T. Galloway Papers, National Agricultural Library, Special Collections.

building area was the anticipated arrival of the Japanese beetle: "All greenhouses will, of course, have to be tightly screened at entrances and ventilators."²⁸

Benjamin Yoe Morrison and the Development of the Glenn Dale Station in the 1930s

In 1930, there was a major reorganization of the work at Bell. The Division of Plant Exploration and Introduction was established with B.Y. Morrison as the Principal Horticulturist in Charge. Morrison also administer the National Arboretum. Morrison, Superintendent of the Glenn Dale station, was the driving force behind the development of the station during these years.

The scattered plantings of deciduous fruits that were then currently under test were concentrated in two orchards, located close to one another at the end of the station. The old introductions were removed, and those needing further testing were placed in the permanent orchard at the rear of the station. A number of the *Pyrus* species (pear) were donated for landscape development of the Mount Vernon Highway. The station established a central nursery for deciduous fruits, an early precursor to the national seed storage program created in the 1950s. A new orchard management program, to monitor orchard practices such as pruning, fertilizing, spraying and soil management, and the effect they have on growth of introductions, was also established; a new method of note-taking, focused on individual tree records replaced a previously inadequate system. New concerns such as the Japanese beetle spurred some of these changes. The station's spray equipment was replaced by a new "Friend Power Sprayer," and a new employee trained in pathology and entomology was brought on to be responsible for the control of diseases and insects.²⁹

In connection with the reorganization of work at Glenn Dale, Morrison initiated a substantial building program for the station. Morrison, who was trained as a landscape architect, sketched out a design for a new office and laboratory building for the station. Modeled after an English Cottage, with steeply pitched gable roofs, trellises along the main facades, and small multi-pane casement windows, this building (Buildings 1, 2, 3) became the prototype for all future buildings erected on the station. Morrison's new plan also involved changes to some of the roads around the buildings, as well as the moving of one of the cottages.³⁰ Between May and June of 1931, one of the cottages (presumably Cottage #1, which appears to have been moved a couple hundred feet south) was moved. In a letter to Morrison while he was overseas, Knowles A. Ryerson, Principal Horticulturist in Charge wrote that "Yesterday was Small Fruit Field Day at Bell - Waldo had a very good crowd. Dr. Taylor was out. He was very much pleased with the buildings. He didn't have much time and wants to come back and

²⁸Harry A. Gunning, Associate Horticulturist in Charge [Glenn Dale], to Knowles A. Ryerson [FPI], March 6, 1928. NARA, RG 54, Entry 135F, Box 6.

²⁹W.E. Whitehouse and J.C. Long, Memorandum to Mr. B.Y. Morrison, "Outline of the Deciduous Fruit and Vegetable Activities at Bell Station, Maryland, Chico, California and Washington, D.C.," November 26, 1932. NARA, RG 54, Entry 135F, Box 69.

³⁰Harry Gunning, Associate Horticulturist in Charge to Joseph Mahoney, Foreign Plant Introduction (Bureau of Plant Industry, D.C.), May 5, 1931. NARA, RG 54, Entry 135F, Box 6. Letter discusses "recent changes in our roads and the general plan of the station."

look over the whole layout more thoroughly. The place does have a mighty good appearance. They are setting up the foundation under the Broderick house - that will be done this next week."³¹

The quarantine work at the station continued to expand, supported by the beginning of what would become a row of quarantine greenhouses to the north of the headhouse, as well as the erection of a cluster of quarantine screenhouses near the western property boundary, at the head of the fields (D-nursery). In the early 1930s, Screenhouse #1 contained 30 peaches, 7 nectarines, 21 apples, 37 apricots, 29 plums, 24 pears, and 3 Rubus; screenhouse #2 contained 12 peach, 9 almond, 17 apricot, 12 plum, 15 pear, 2 pomegranate, 28 cherries, 4 walnuts, 8 apple, and 1 nectarine. When released from quarantine, these items were either planted in the orchard at Bell, sent as scions or trees to Chico, or sent to federal and state workers. Of the deciduous fruit and vegetable introduction work, all quarantined material was ultimately supervised by the Bureau of Plant Quarantine. When the material arrived in Washington, it was grown by the Bureau's choice at either the Inspection House in Washington, the new quarantine greenhouse at Beltsville, or the specially constructed screenhouses at Glenn Dale.³²

In 1931, from March to September, Morrison was away on a trip to Great Britain, Germany, Holland, Belgium, France, Switzerland, and Italy. He sought to establish relationships with the directors of botanic gardens and arboreta, the owners and superintendents of estates where there were important plant collections, and with nurserymen from whom material has been or might well be purchased. With his work planning the reorganization of work at the Glenn Dale station, he also planned to study the administration of these different establishments.³³

During this decade, the station expanded to work the land located to the south of the station property, a 20-acre rectangular plot that ran in an east-west direction, creating an "L"-shaped property. The land was leased by the station in 1930 and ultimately purchased in 1940. The most distinguished feature of the land was a large hill that rose immediately from the edge of the original station tract. Known as Watson's Hill, it was named for the farmer who occupied the land beginning in 1919. Watson had purchased it from a Mr. Hammer, who had had no livestock and did not farm the property. Hammer had passed through the Glenn Dale station on foot to get to the trolley, using the property "more as a camp than a homestead."³⁴

Aerial photographs, taken in 1932 and 1938, reveal the extent to which the acreage of the station was being used. Fully 65 of the 70 acres were under development, and the five acres not tilled was a

³¹Knowles A. Ryerson to B.Y. Morrison, June 6, 1931. NARA, RG 54, Entry 135F, Box 69.

³²W.E. Whitehouse and J.C. Long, Memorandum to Mr. B.Y. Morrison, "Outline of the Deciduous Fruit and Vegetable Activities at Bell Station, Maryland, Chico, California and Washington, D.C.," November 26, 1932. NARA, RG 54, Entry 135F, Box 69.

³³Knowles A. Ryerson, Principal Horticulturist in Charge, to Dr. W.A. Taylor, January 28, 1931. NARA, RG 54, Entry 135F, Box 69.

³⁴Superintendent Goucher to Roland McKee, Foreign Seed and Plant Introduction, January 8, 1926. Correspondence related to right-of-ways, located in the office files, Building 1, Glenn Dale.

wooded area located in a gulch at the very southeastern corner of the Watson's Hill property, inaccessible to the workers of the station because of its topography. Much of the Watson's Hill area in the aerial photographs is cultivated. In particular, the south side of the hill, which is shaped like an amphitheater, is grown in what appears to be a terraced semi-circular pattern. The photographs also clearly illustrate the orchards located in the southern third of the original station property, the variety of plots -- some fallow, some active -- at the head of the fields, and the ornamental plantings located at the northern end of the station surrounding the buildings. Individual plant specimens are distinguishable. Those most impressive are no longer extant. These include the enormous sawtooth oak, the largest tree on the property in the photographs, located to the east of Building 1; it blew down and was removed in 1995. Also visible is the original Bradford pear, located along the northern boundary of the station at the middle entrance. This tree was taken down in early 1960s, after it was damaged in a storm. In the very middle of the central section of the fields are visible a cluster of large trees, two of which are still extant, including a sawtooth oak (daughter of the original one by the office) and a Zelkova Schneideriana. Surrounding the cul-de-sac at the northwestern corner of the station, by the two secondary cottages, are a number of planting materials, many of which are still extant. At the rear of the station's original 50-acre parcel were the orchards, where a number of large trees are visible in the aerial photographs. Today one tree remains, a relative of the Turkish filbert, originating from a specimen collected by Frank Meyer. Considered to be the largest specimen of its kind, it is located at the intersection of the roads at the foot of Watson's Hill, at the corner of what was at one time referred to as the nut block. The nut block contained hickories, oaks, chestnut trees, and other specimens. The Forestry Service came in to the Glenn Dale station for years to collect seeds, which they transported to Appalachia to grow out plants, which would in turn provide fruits for the wild turkeys native to that area.³⁵

Morrison and the Azalea Breeding Project

Benjamin Morrison initiated his research at Glenn Dale on azaleas in 1929, and continued it through the 1930s and '40s. The goal of the program at its start was to create a series of azaleas that would be winter-hardy at least as far north as Washington, D.C. One other key goal of the research was to produce azaleas with large flowers, akin to those varieties common in the South at the time. Predictably, the program was expanded during the course of its history and certain varieties of azaleas were produced that while not meeting the original criteria were found to be valuable in themselves.³⁶ The work was conducted principally in the Azalea Woods, a wooded area at the southwestern corner of the station, where native trees provided an appropriately shady location. Paths through the woods, still extant today, provided ample access to much of the wooded acreage. Many of the plants are still extant in the woods, and recent volunteer efforts of the Azalea Society of America have been underway to document the species; they have been successful in identifying many of the plots that still

³⁵Site visit with Dr. Ackerman and Dr. Waterworth, conducted by Heather Ewing, Robinson & Associates, Inc., October 30, 1996.

³⁶B.Y. Morrison, *The Glenn Dale Azaleas*, Agriculture Monograph No. 20, p. 10. Washington, D.C.: United States Department of Agriculture, October 1953.

exist based on existing documentation and the appearance of the plants in flower.³⁷

Morrison's historic work on the Glenn Dale hybrid azaleas, perhaps one of the most well-known plant materials to emerge from the station during its history, was continued by others in subsequent years. Morrison wrote, in fact, that "nearly every person who has worked at the station, in one way or another, has assisted in the life of the plants."³⁸ In the late 1950s and early 1960s, J.L. Creech worked to recover some of the material from Morrison's experiments that existed primarily only at the Glenn Dale station; he succeeded in transporting a large number of the original materials developed by Morrison, to the National Arboretum, where they were installed at Azalea Hill. Creech also at this time made his own selections from a series of crosses between Glenn Dale and Belgium azaleas, the five most outstanding of which were named and released in 1962: "Bayou," "Green Mist," "Petite," "Pink Ice," and "Whitehouse."³⁹

The Glenn Dale Station During World War II

The Glenn Dale station during the 1940s was devoted to an enormous propagation project concerning the cinchona tree, whose bark provided a critical source of quinine, effective in fighting malaria. Although this plant was originally native to the Americas, by the 1930s the United States relied heavily on countries overseas for its supply. With the outbreak of World War II, the supply lines were cut off, triggering the massive propagation project that dominated the Glenn Dale station's activities during World War II. After Pearl Harbor, a final shipment of seeds were flown in to Glenn Dale from the Philippines. Propagated in many of the station's greenhouses, these growths were then flown out to tropical America, where commercial culture was deemed practical. The government was actively assisting in a number of plantation operations in South America and Puerto Rico. The cinchona seeds were only one of 2,125 items that arrived during 1942, half the usual number received at the station during a typical year. A new technique, the use of sifted dry sphagnum moss as a medium in which to plant seeds in greenhouses, hotbeds, and coldframes, which had first been suggested in 1941, was found to be a success. Workers at Glenn Dale controlled "damping-off," a fungus disease that often kills seedlings, by collecting living moss from neighboring bogs. Equally good results were found also to be achieved using dried moss from florist supply houses.⁴⁰

In 1943, the *Annual Report of the Department of Agriculture* boasted that more than 150,000 seedlings were growing in Puerto Rico, Central and South America, flown from Glenn Dale, as part of the cinchona project.⁴¹ A high demand from the War Department's plantation in Costa Rica further

³⁷Conversation with Barbara Bullock, Curator of Azaleas, National Arboretum, December 4, 1996; William Miller, Azalea Society of America, December 12, 1996; with Heather Ewing of Robinson & Associates, Inc.

³⁸Morrison, *The Glenn Dale Azaleas*, p. 1.

³⁹Ackerman, "The Introduction of New Plants from Foreign Lands," *The Garden Journal*, November-December 1965, p. 244.

⁴⁰*Annual Report of the Department of Agriculture for 1942*, p. 19.

⁴¹AR 1943, p. 24.

increased the numbers being grown at the Glenn Dale station. In 1944, the following year, 250,000 seedlings were shipped, and many more were being propagated under glass at Glenn Dale. Virtually all of the greenhouses were devoted to the project, as well as to side projects such as the growth and shipment of *Elaeis* (oil palm), *Caesalpinia* (tannin), and *Derris* (insecticide).⁴² The work of disseminating large propagations to other countries, principally in Central and South America, occupied the majority of effort at the various plant introduction gardens. In the 1944 *Annual Report of the Department of Agriculture*, the plant introduction gardens were listed as having distributed 231,481 items to foreign countries (most to Latin America) and only 38,558 items domestically.⁴³ The shipment of 200,000 seedlings to special cooperative cinchona plantations in Costa Rica in 1945 essentially completed the program at Glenn Dale. A small basic collection of all strains, races, and species was maintained under propagation at the station -- enabling rapid increase in the event of an emergency at any of the cooperative stations. This important function, as a storage for plant germplasm, was one that the station had performed in numerous instances; it was a critical and often overlooked element of the plant introduction system in general, which was only institutionalized on a national level in the late 1950s.

The quality that had most characterized the work of the station during the war was the role of the Glenn Dale station as an intermediary stage, growing plants that were not intended to be crops of the United States. In addition to the cinchona project, the station grew coffee from Africa, ensuring that it was free of rust disease before shipping the seedlings to plantations in South America. Bananas, too, were grown to protect against disease; delivered from Hawaii and the Pacific Islands, bananas were shipped when determined clear to an island off of Honduras.⁴⁴ All of these items were important consumer products in the United States, but none was to be developed as a native crop.

The Glenn Dale Station After World War II

As normalcy returned to the Glenn Dale station after the war, other projects were undertaken. The testing of foreign apples was begun in the orchard fields. Among the greenhouses, experiments with fluorescent lights were initiated; these involved examining rooting cuttings and growing seedlings under the light, permitting close control of humidity and freedom from excessive temperatures. Workers developed model propagation cases for these experiments during the year.⁴⁵

The general goals of the division after the war were redefined as:

- the introduction of plants that could be used directly in supplying primary

⁴²AR 1944, p. 26.

⁴³AR 1944, p. 26.

⁴⁴Oral interview with Dr. William Ackerman, conducted by Heather Ewing, Robinson & Associates, Inc., June 9, 1995; site visit with Dr. Ackerman, October 30, 1996. Ackerman stated that the young banana trees were pushing right up against the glass roofs of the propagating greenhouses (such as Buildings 5 and 6).

⁴⁵AR 1946, p. 55.

- materials for chemical or manufacturing industries;
- the introduction of plants possessing special characteristics that could be used in breeding programs to improve economic plants for agricultural or industrial use (disease/insect resistance, cold/drought tolerance);
- the evaluation, cataloguing, and preservation of introduced plants;
- the evaluation, cataloguing, and preservation of native plant materials that had not been adequately tested for agricultural or industrial use.

With the renewal of activities and goals for the plant introduction system came a call for a regional plant introduction system. Increased funding from Congress spurred research programs on new economic crops and the creation of regional plant introduction stations. At this time, the Department also renewed its foreign plant exploration work, as little in this area had been done in the past ten years.

The 1959 site plan reveals much about the operations of the station's grounds in the period following the changes instituted by B.Y. Morrison. [The drawing of the site plan was probably executed in the 1930s and the 1959 date reflects a revision date.] The area around the buildings in the plan was surrounded by a number of nursery test plots and cold frames. Just south of Cottage #1 (Building 32) is a large rectangular nursery, labeled the Superintendent's Nursery, which could have been used for individual or personal projects. Dr. William Ackerman said it was gone by the time he became Superintendent in 1959.⁴⁶ To the east of the main propagating greenhouses (Buildings 5, 6, etc.) was a Test Nursery, consisting of two large plots. This area was dedicated to ornamental plantings, and contained a number of large specimens, such as the station's original sawtooth oak. Just to the north of the test nursery were several herbaceous beds. The east-west axis providing a visual approach to the Main Office (Building 1) was left open between these beds. Just to the east of the secondary cottages, along the station road that leads south from the parking lot, was a row of cold frames. Like the lean-to greenhouses, these cold frames were typically designed on south-facing walls, to receive the north light.

South of the Shipping and Packing Building (Building 20) and the lathe propagating houses (Buildings 17, 19), across the east-west road crossing the property and dividing the buildings from the fields, were two rows cold frames. South of this cluster of cold frames was a nursery block called the East-West Nursery. It is possible that the large trees currently located in this area (near Building 41) were once part of this nursery, but no information has been located on their history. To the south of the farm building cluster (Buildings 42-44) along the eastern perimeter of the property, the site plan indicated that there was a pasture. This was probably used for the horses that were kept in the barn. At a later date, this became part of the planting plots, all of which were rotated and contained a variety of plantings. Dr. Waterworth described this area as containing the kenaf project at one point, as well as some of Dr. Ackerman's work on Japanese irises [see below].

Just to the west of the pasture was the first field, called the A-nursery. The fields, as have been described earlier, were arranged by letter from east to west, beginning with A and concluding with D. Numerically they extended south towards the perimeter of the original 50 acres, separating each letter

⁴⁶Site visit with Dr. Ackerman, with Heather Ewing of Robinson & Associates, Inc., October 30, 1996.

block into distinct, smaller plots. The B-nursery began at a point south of the East-West Nursery on the 1959 site plan. The principal drive that lead from the buildings out to the fields provided a physical separation between the B-Nursery and the C-Nursery. D-Nursery, located adjacent to the western perimeter of the property, contained the three Quarantine Screenhouses in its northeastern corner.

The Glenn Dale Station in the 1960s and 1970s

Under Dr. William Ackerman, who became Superintendent in 1959, Glenn Dale began a program "of wide crosses" (difficult or frequently unsuccessful) of camellias, to develop hybrids with wider genetic variation. Camellias had long held interest in Asia for economic reasons, as tea and oil could be extracted from the seeds of certain species. In Europe and America, interest in the plant existed solely for its ornamental values. The camellia had been introduced to the United States in the late 18th century, its popularity had waned towards end of the 19th century, and it had not been revived until after World War II. By 1971, the Glenn Dale collection consisted of 26 species that had been collected by plant explorers between the 1940s and 1960s. In his historic work on the flower, Ackerman used 20 species as parents for interspecific crosses, resulting in 459 hybrids from 106 combinations. Most of these controlled crosses were made in greenhouses screened against insects, obviating the need to protect the flowers from undesired pollination. Other flowers, grown outdoors, were bagged for protection from pollination by insects. Their growth was carefully monitored; the night period between September and March was broken between 10 p.m. to 2 a.m. with incandescent light to accelerate growth.⁴⁷ This work resulted in a collection of camellias that was the largest and most outstanding of its kind outside of Asia.

The camellia project was part of a research program in ornamentals headed by Ackerman, who arrived at Glenn Dale from the Plant Introduction Station at Chico, California. Other components of the program included work on Japanese iris, holly hybrids, and continuing work on the ornamental pears [see Bradford pear below]. The Japanese iris were planted in several different locations around the station, including on the southeast side of the pond and south of the barn (Building 44). Lone iris are occasionally visible by the pond in the spring. The holly hybrids, the result of a cross between *Ilex cornuta* and *I. ciliospinosa*, were being tested for cold hardiness, form, leaf type, and berry profusion.⁴⁸ A number of individual hollies, placed in the permanent plantings around the buildings, are still extant.

Specialty or chemurgic crops -- which include new potential drug, fiber, and industrial crops not yet commercially grown in the United States -- were another area of introductions grown at the Glenn Dale station. By the early 1960s, one of the most interesting specialty crops under investigation was the Mexican yam, *dioscorea*, which represented an important source of cortisone and other precursors to steroidal drugs. Research on the yam at Glenn Dale, conducted initially in the main propagating greenhouses (Buildings 5 and 6), related to developing the optimum environment for growth and

⁴⁷William L. Ackerman, "Genetic and Cytological Studies With *Camellia* and Related Genera," *Technical Bulletin No. 1427, Agricultural Research Service, United States Department of Agriculture*, Government Printing Office: Washington, D.C., September 1971.

⁴⁸William Ackerman, "Testing Many Plants for Introduction," *American Nurseryman*. July 1, 1961.

propagation. Once the challenges of reproducing high-yield clones were overcome by scientists at the station, the project was terminated.⁴⁹

In the late 1960s, Dr. Joseph J. Higgins directed the investigation of several new chemurgic crops. Many of the fields of the station during the late 1960s and through the 1970s were devoted to these projects. Among the exotic crops planted were "Crambe abyssinica," of the same family as rapeseeds and mustards, which contained an oil in the seed with potential for industry -- particularly the manufacture of synthetic fibers, rubber, plastic coatings, etc. -- because it never disintegrated; "Limnanthes," another crop with oil in the seed, which could be converted into waxes and greases for industry, and which Colgate-Palmolive desired for its lubricating potential; "Stokesia," which was believed to have beneficial pharmaceutical properties; and "Hibiscus cannabinus" or "Kenaf," which provided excellent fiber for pulp and paper products. Known to grow 14 feet in a single year, kenaf provided a greater yield of fiber in a year than comparable forest tree growth.⁵⁰ The kenaf project, a \$4.5 million Agricultural Research Service study, had been started in 1960 at the Northern Regional Research Center in Peoria, Illinois, in conjunction with colleagues at Beltsville, Maryland, and Savannah, Georgia. The Crops Research Branch, of which Higgins was an employee, was headquartered at Beltsville. Kenaf was grown at Glenn Dale to study the general effect of temperature on yield. The rate at which new leaves were produced at the top of the main stem was recorded frequently; plants were also harvested at different times, and observations were made then as well as to the plant's dry weight and the number of leaves of the plants.⁵¹ One of the known locations for the kenaf plantings was south of the barn (Building 44).⁵² Kenaf was also grown at Glenn Dale in conjunction with research trials being conducted in Peoria. In 1968, kenaf was grown for use in a research run of bond paper composed of a 60% mixture of hardwood and softwood fibers and 40% kenaf fibers; the paper produced was considered comparable in strength to paper from all-wood fibers. Although it contained some blemishes in appearance, which were determined not to be connected to matter inherent in kenaf pulp, the Non-wood Plant Fibers committee of the Technical Association of the Pulp and Paper Industry planned to use it as letterhead. Eight other locations around the country were also selected along with Glenn Dale for the temperature trials. The kenaf project results indicated that yields were greatest in those regions of the country with the highest temperatures, the longest growing season, and non-limiting soil moisture. The research study was concluded in 1978 "with the rationale that we had proven the technical feasibility," and a subsequent Kenaf Demonstration Project was begun in 1986, which continued the research with a more specific focus on a single product line, newsprint.⁵³

⁴⁹Ackerman, "Testing Many Plants for Introduction."

⁵⁰Ackerman, "The Introduction of New Plants from Foreign Lands," reprinted from *The Exchange*, no date [ca. early 1970s].

⁵¹G.A. White, et al, *Culture and Harvesting Methods for Kenaf: An Annual Crop Source of Pulp in the Southeast*, Agricultural Research Service, U.S. Department of Agriculture, Washington, D.C., April 1970.

⁵²Oral interview with Dr. Howard Waterworth, conducted by Heather Ewing, Robinson & Associates, Inc., September 30, 1996.

⁵³Kenaf Brief, cover statement by Marvin O. Bagby, Research Leader, Oil Chemical Research, Agricultural Research Service, USDA, Peoria, Illinois. no date (post 1986). The Kenaf Demonstration Project is a public-

In addition to the ornamental and specialty crop work conducted at Glenn Dale, Dr. Ackerman brought a focus on fruit trees, in conjunction with a new virus-indexing program, centered in the quarantine greenhouse facilities of the station. Dr. Howard Waterworth, subsequently to become the last official Superintendent of the Glenn Dale site, was brought in to assist with the indexing program; he focused on apples, indexing all the new apple variety introductions as well as the more important varieties among the 1000 or so clones in the station's permanent orchard.⁵⁴ Subsequently, as the virus-indexing program grew, Dr. Robert Kahn was also hired, to perform the work on peaches and plums. By the late 1960s, this work had expanded to include grapes and other items.

The Bradford Pear

One of the events that generated immense activity for the Glenn Dale station in its later history was the release of the Bradford pear in 1960. The tree was named for Frederick Bradford, the Superintendent of the station prior to J.L. Creech, by Dr. J.L. Creech and Dr. Whitehouse (Whitehouse was incidentally Bradford's brother-in-law). Bradford, who had lived in Cottage #1 (Building 32), had died at the station. The pear, as noted earlier, had been a continual aspect of research at Glenn Dale. Plant explorer Frank Meyer, in one of his last acts before his death, had collected more than 100 pounds of *Pyrus calleryana* seeds and shipped them back to the United States; he had noted that tree's ability to thrive in many different soil environments in China. Testing of the tree as rootstock had been extensive at Glenn Dale in the 1930s. Free of disease and insects, the tree had extensive blossoms in the spring, yellow foliage through the summer, and a brilliant russet color in the fall, with the leaves remaining on the tree well into late fall/early winter. Its compact shape made it especially appealing for residential planting. In 1954, J.L. Creech organized a successful test planting of the tree in University Park, a then-treeless subdivision in Maryland near the District of Columbia.⁵⁵

The Bradford pear received its greatest publicity in a ceremonial planting at the U.S. Department of Agriculture grounds on the National Mall, which was attended by Lady Bird Johnson. The ceremony included the planting of two or three six-foot specimens. It was heavily covered by the national press, resulting in an unrelenting flood of requests for the tree at the Glenn Dale station. The original Bradford pear tree, planted at the very beginning of the station's existence, stood at one of the entrances to the station, on the west side of the parking lot (in planting P4). Dr. Ackerman, during his tenure as Superintendent, was forced to call for the tree to be taken down at the height of its popularity, after it was damaged in a storm in the early 1960s; he felt it was ill-advised to have this injured specimen so prominently on display at the station. To mitigate the loss of the tree, Ackerman

private partnership to make kenaf industries a reality. A Kenaf Rio Grande newsprint mill in the Lower Rio Grande Valley of south Texas is in process of startup.

⁵⁴This orchard, which typically contained two examples of each variety as a kind of bank, was bulldozed in the 1980s, after cuttings from all the trees had been sent to the various regional stations around the United States handling each variety. Site visit with Dr. Howard Waterworth, with Heather Ewing, Robinson & Associates, Inc., October 30, 1996.

⁵⁵William E. Whitehouse, J.L. Creech, G.A. Seaton, "Bradford Ornamental Pear: A Promising Shade Tree," *American Nurseryman*, April 15, 1963.

planted Bradford pears along the principal entrance road, creating an elegant formal allée to the station.⁵⁶

The Bradford pear was grown widely throughout the Mid-Atlantic states and west as far as Mississippi. It was listed among the ten most recommended trees of several of these states. As time wore on, it became apparent to the scientists at Glenn Dale that a more upright or columnar form of the tree was desirable for narrow streets. The Whitehouse pear, named in honor of Dr. William E. Whitehouse, a retired Senior Horticulturist with the Department of Agriculture, thus was selected in 1969 from the approximately 2,500 seedlings then growing at Glenn Dale. The original Whitehouse pear tree developed accidentally, as an open pollinated seedling, a cross presumably between the Bradford Pear and one of the many strains of *Pyrus calleryana* growing at the station. Physically it was located on the property of Mr. Radford Rigoli on Bell Station Road, outside of the Glenn Dale station grounds. This was an example of how the station appears to have operated throughout its existence. Informal arrangements with the surrounding neighbors, many of whom were farmers or horticulturists themselves, provided additional opportunities for sampling varieties.⁵⁷ The original Whitehouse pear, which was destroyed prior to 1977, was propagated and grown in orchard and landscape plantings at Glenn Dale.⁵⁸ The virus-indexing program of introduced fruit, grain, and vegetable germplasm continued to dominate the activities of the station through to its most recent years.

The Expansion of the Plant Introduction System, and the USDA-States Cooperative Program (1948-1975)

After World War II, significant changes were made to the plant introduction system. In 1946, the Research and Marketing Act was passed by Congress, which included funding for regional "New Crops" programs. Centered at Beltsville, Maryland, this program encouraged research on new crops that could partially replace economic crops considered surplus or in over-production. By 1952, four Regional Plant Introduction Stations had been established in different quadrants of the United States, and a single interregional project created in Wisconsin to handle potatoes. The regional programs effectively coordinated the needs of federal, state, and individual plant specialists. The Act also provided increased funding for explorations to collect materials supporting this research. It was recognized at the same time that the longterm storage of valuable germplasm was necessary to preserve plant materials introduced into the United States, as many of the items brought in since 1898 could no longer be found extant in this country. In 1958, the National Seed Storage Laboratory was established at Fort Collins, Colorado. Up until this time, the Plant Introduction Station at Glenn Dale had served as the nation's unofficial "savings account" of the plant germplasm collections: two specimens of those items coming through the Glenn Dale station that in order to be collected had to be

⁵⁶Site visit with Dr. William Ackerman, October 30, 1996.

⁵⁷An undated memorandum listing a series of leases with neighbors indicated that the station operated on an additional 30 acres outside the property lines of the station. Memorandum, "Summation of Land used by the Bureau of Plant Industry at Bell, Maryland," n.d. [ca. 1927]. RG 54, Entry 135F, Box 2.

⁵⁸William Ackerman, "'Whitehouse' Ornamental Pear," *HortScience*, Vol. 12 (6), December 1977.

held as living plants -- i.e., could not be stored in a seed form, such as fruit trees, shade trees, sugar cane, etc. -- were kept by the station in the field. Seeds were housed in a new seed storage building (Building 21), completed in 1952.⁵⁹

In addition to highlighting the need to preserve introduced germplasm, the Regional Plant Introduction system infused new sources of funding into the Department's activities. Money from the regional system funded the renovation of Glenn Dale's two main propagation houses, Buildings 5 and 6. Additional construction that was undertaken at the Station included the extension of Quarantine Greenhouse #3 (Building 31).

By the 1950s and 1960s, nearly all of the Glenn Dale station's 70 acres were cultivated, and as many as 6,000 plants were being grown. On the property there were 13 greenhouse units, comprising a total of 34,000 square feet of glazed area, 5,000 square feet of screened outdoor beds, and 29 cold frames. A major coffee program was underway to grow out introductions from Africa before sending them on to South America, as part of an effort to prevent the spread of devastating crop diseases. The Bradford Pear tree, selected by Frederick Bradford, was released during the 1950s. It has since become one of America's major landscape elements. The mission of the Glenn Dale station concerned the "propagation, testing, and distribution of rare and valuable economic and ornamental plants from foreign countries and United States possessions; propagation under quarantine detention of foreign plants where required by law."⁶⁰

Plant Quarantine at the Glenn Dale Station

In the late 1950s, the Glenn Dale Station was officially designated as the country's federal plant quarantine station. While a tradition of plant quarantine activities existed at Glenn Dale, explicit virus tests were conducted on introductions, beginning in 1957 with the appointment of Dr. Robert Kahn. This indexing began first with the five stone fruits (cherry, apricot, peach, plum, and almond), but soon expanded to include other plants, such as potatoes, sweet potatoes, and sugar cane.

Despite the devastating effects that pests can have on a country's economy or the health of its population, little consideration had been given to the inadvertent importation of pests into the United States in the nineteenth and early twentieth centuries. Problem pests introduced to the United States include the gypsy moth, the Japanese Beetle, and the Dutch elm disease.⁶¹ The first federal quarantine law in the United States was enacted in 1912, after the white pine blister rust and the chestnut blight

⁵⁹Hodge, *Advances in Agronomy*, p. 208. Dr. Howard Waterworth stated that when he arrived at the Glenn Dale station in 1964, there were hundreds of varieties (two specimens each) of apples, pears, and woody ornamentals. When the regional plant introduction stations were established to serve as huge repositories, cuttings were made from these trees at Glenn Dale and sent out. The orchards were bulldozed in the 1980s to make way for other projects. Interview with Dr. Waterworth, September 30, 1996.

⁶⁰*Directory of Activities of the Bureau of Plant Industry, Soils, and Agricultural Engineering, 1952.* Agricultural Handbook No. 47, Washington, D.C.: U.S. Government Printing Office, 1952. p. 65.

⁶¹Interview with Dr. Howard Waterworth, May 18, 1995.

fungus had become established in this country.⁶² This act was supplemented by the Organic Act of 1944, which authorized survey and control programs against endemic and exotic pests, and the Federal Plant Pest Act of 1957, which authorized emergency actions to prevent the introduction or interstate movement of pests not covered in the 1912 act.

The Glenn Dale station was distinguished from the other federal stations by its function as the plant quarantine center for the U.S. Department of Agriculture. Glenn Dale acted as a holding area for newly introduced plant imports, until such a time as the U.S. Plant Quarantine Division was ready to release them.⁶³ Quarantined plants were contained in specially constructed greenhouses.

Plants entering the United States first cleared the U.S.D.A. Inspection House at 224 12th St., S.W., Washington, D.C. Since the closing of the Inspection House in the early 1970s, this step has been handled at the Plant Germplasm Quarantine Center at Beltsville, Maryland. The three categories for quarantined plant material are prohibited, restricted, and postentry. Those plants falling in the prohibited category are typically sent to Glenn Dale for testing in quarantine; they originate from parts of the world that have serious disease problems, most of which do not exist in the United States. Those plants in the restricted category, which encompass most plant materials coming into the United States, are inspected, perhaps given fumigation treatment, and sent on to the appropriate importer. Those plants considered in the intermediate postentry category must, after inspection and treatment, be grown under close observation. This work is still done today at Glenn Dale, where specimens are closely observed and tested. The tests, which vary according to genus, include molecular assays, biological assays, and electron microscopy to assess pathogenicity. Some infected plants are given therapy to produce pathogen-free germplasm.⁶⁴

During the 1970s, Glenn Dale continued to serve the plant introduction system as the primary quarantine facility of the Agriculture Department. Some of the more notable introductions brought through the Glenn Dale station during this time were the New Guinea impatiens, and the Japanese honsai trees, given by Japan to the United States in 1975 in celebration of the U.S. Bicentennial. The honsai collection is today located at the National Arboretum.

In the early 1980s, it was determined that the station at Glenn Dale was unable to address adequately the needs of a modern plant quarantine facility. Updated and modern systems are required to contain securely the pathogens that may be found on new introductions. Additionally, many of the procedures and materials used at Glenn Dale in the earlier decades of this century were discovered to have continuing deleterious effects. There were no modern pesticides in the 1920s; it is likely that scientists

⁶²Howard E. Waterworth and George A. White. "Plant Introductions and Quarantine: The Need for Both," *Plant Disease*, January 1962.

⁶³William L. Ackerman, "Evaluation of Early Ripening Apple Introductions." According to Hodge (*Economic Botany*, p. 314), plants introduced as seed seldom require quarantine procedures, although there are some exceptions.

⁶⁴Informational plaque on wall of Japanese Beetle Corridor leading from Building #1 to Building #4 at Glenn Dale, MD.

at Glenn Dale used mercurial sea treatments, arsenic compounds, lead-containing compounds, and, in the post-Depression era, DDT, in treating plants.⁶⁵ A new and modern facility, the National Plant Germplasm Quarantine Laboratory, was begun at the nearby Animal and Plant Health Inspection Service (APHIS) facility near the Beltsville Agricultural Research Center in 1983. Currently, nearly half of the Agriculture Department's plant quarantine activity remains at Glenn Dale. While the government has already appropriated funding for the continuation of construction of the new APHIS facility, the entire complex has yet to be completed. Those structures that have already been erected at Beltsville by the Animal and Plant Health Inspection Service reflect the needs of contemporary plant quarantine. All laboratories, greenhouses, and screenhouses are state of the art.⁶⁶

U.S. National Arboretum Activities at Glenn Dale

Today Glenn Dale is both a plant quarantine facility used for pathogen-indexing of introduced fruit, grain, and vegetable germplasm, as well as a location for many field plot experiments on tree and shrub genetics, and the site for the Woody Landscape Plants Germplasm Repository.⁶⁷ Since the mid-1970s, new cultivars of, for example, elms, maples, birch, hemlocks, and lilacs, have been bred and evaluated for disease- and insect-tolerance in research programs to develop improved woody landscape trees and shrubs. The research program occupies several buildings, polyhouses, and greenhouses, as well as about six acres of field plantings. In the fall of 1990, the first planting of the Woody Landscape Plant Germplasm Repository was begun at Glenn Dale. The WLPGR is a component of the U.S. National Plant Germplasm System managed by the USDA's Agricultural Research Service. Its mission is to collect, maintain, evaluate, distribute, and preserve woody landscape plants. The repository operates principally out of a trailer (Building 47), a prefabricated metal structure (Building 46), and the renovated Seed Storage building (Building 21); adjacent to the office trailer are two Quonset Hut-style temporary growing shelters. Present plantings include 3,300 accessions of woody trees and shrubs covering approximately 14 acres.

The important work of the Plant Introduction Garden at Glenn Dale spans over 75 years. It includes the quarantine, introduction, and propagation of literally thousands of species of plants which today have had an important contribution to American commerce, agriculture, or horticulture. Many varieties of azaleas that are planted in the Mid-Atlantic and north, as well as hardy camellias, the Bradford-type ornamental pears, and New Guinea impatiens to name a few, are linked to work done at Glenn Dale. Established at the height of U.S.-sponsored field explorations, the Glenn Dale station evinces the development in this country of a sophisticated program to increase the productivity and variety of American agriculture. The materials collected and introduced during this period (1898-1930) probably contributed more to crop improvement than any other time in U.S. agricultural

⁶⁵Interview with Dr. Howard Waterworth, May 18, 1995.

⁶⁶Waterworth, "Processing Foreign Plant Germplasm at the National Plant Germplasm Quarantine Center," pp. 854-860.

⁶⁷George A. White, Henry L. Shands, and Gilbert R. Lovell, "History and Operation of the National Plant Germplasm System," p.10.

history.⁶⁸ The Glenn Dale station also played a supporting role in the United States' foreign aid programs, such as through the large coffee-growing program after World War II. Most importantly though, as the U.S. Department of Agriculture's primary plant quarantine facility, the Glenn Dale station served a unique function within the government's plant introduction system.

The Glenn Dale station was the most highly developed of the four federal plant introduction stations, and the only one which serviced the central Department of Agriculture headquarters and the Inspection House, which was the first stop for all plant materials entering the United States, in Washington. The station provided a needed facility where immediate care could be given to plant material weakened by long transit from abroad.⁶⁹ Glenn Dale was unique in its role as the primary plant quarantine facility for the Department of Agriculture. Because of its ample greenhouse units and facilities for propagation of all plants, the Glenn Dale station was typically the one selected for extensive propagation activities, both for specialty items for the United States and for foreign aid programs. The station received an enormous range of plant species from around the world and served as an important source of propagules and information for use by growers. It was the first step for many of the plants brought into the United States; often materials for the other federal introduction stations and the regional experiment stations passed first through the Glenn Dale station.

In addition to the introduction activities at Glenn Dale, research activities were also carried out to cultivate strains of plants that would improve upon extant varieties by creating more hardy varieties or ones that increased yield. Many of its successes related to ornamental and landscape plants. One example familiar to the public are the Glenn Dale azaleas. Over 450 varieties, the result of the largest azalea breeding program in the country, were developed to be winter-hardy in the Washington, D.C., climate.⁷⁰ Many of these specimens are today on display at the National Arboretum. The camellia was another plant that was not winter-hardy. Research at Glenn Dale virtually doubled the range of this beautiful shrub, which originally could not be grown north of North Carolina; and 17 new varieties were developed. The Bradford Pear and similar ornamental-type pears were also products of research at Glenn Dale. One of the most popular landscape elements in use today, the pest-resistant Bradford Pear was named for Frederick Bradford, the station superintendent during the 1950s when the plant was released. The Glenn Dale station also maintained an orchard collection of pome fruit variety introductions. This collection of over 800 varieties of foreign and domestic apples was used for testing and evaluating quality in the search for new sources of good early ripening apples to supply the summer fresh fruit market, and the search for late blossoming apples.⁷¹ The Glenn Dale facility has also been used since the mid-1970s by the USNA's Floral and Nursery Plants Research Unit to

⁶⁸Hyland, p.10.

⁶⁹Hodge, *Advances in Agronomy*, p. 201.

⁷⁰B.Y. Morrison, *The Glenn Dale Azaleas*, Agriculture Monograph No. 20, United States Department of Agriculture, Washington, D.C., October 1953.

⁷¹William L. Ackerman, "Evaluation of Early Ripening Apple Introductions," *Series I. Evaluation of Foreign Fruits and Nuts*. No. 11: Apples. U.S. Bureau of Plant Industry, Soils and Agricultural Engineering, September 1962.

evaluate, in landscape tree and shrub breeding programs, new cultivars of, for example, elms, maples, birch, hemlocks, and lilacs, for disease- and insect-tolerance. Since 1990, the Unit also has maintained at Glenn Dale the Woody Landscape Plants Germplasm Repository (WLPGR), a component of the U.S. National Plant Germplasm System.

III: SOURCES OF INFORMATION

A. Engineering Drawings

Cottage #2 [Building 34], designed by the Office of Public Roads and Rural Engineering, Division of Rural Engineering, November 25, 1919. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Cottage #1 [Building 32], designed by the Office of Public Roads and Rural Engineering, Division of Rural Engineering, November 28, 1919. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Irrigation Plan, Plant Detention Center at Bell, Maryland, prepared under the direction of S.H. McCrory, Chief of the Division of Agricultural Engineering, 1922. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Storage Shed for Nursery Stock [Building 20], designed by the Office of Public Roads and Rural Engineering, Division of Rural Engineering, June 9, 1922. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Entrance Road to Glenn Dale Station, December 25, 1925. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Heating Layout for the Beltsville Field Station at Glenn Dale [for Plant Quarantine Greenhouse #1, Building 28, per handwritten note by Ackerman 1-20-70 on verso], November 1929. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Greenhouse Building Plans, American Greenhouse Manufacturing Company, November 8, 1929. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Plant Introduction Garden, Bell, Maryland [topography map], 1930. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Proposed Development, U.S. Plant Introduction Garden, Bell, MD, drawn by Benjamin Y. Morrison, December 18, 1930. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426. Superimposed on the original drawing is the extension irrigation system. Pencil note on drawing: "This system was abandoned in 1958 when we connected to WSSC line and stopped pumping from pond."

Proposed Quarantine Greenhouse, June 1933. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Proposed Detention Headhouse, July 1933. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Greenhouse for U.S. Department of Agriculture, Beltsville [Quarantine Greenhouse #2, Building 29], November 20, 1933. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Plot Plan, Bureau of Plant Industry, U.S. Plant Introduction Garden, Bell, Maryland, May 31, 1935. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Detail for Steam Control in Soil Sterilization Compartments 3 and 4, March 5, 1937. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Proposed Greenhouse for the Soil Conservation Service, Hill Culture, Glenn Dale, MD [Buildings 24, 25, 26], plans prepared by F.C. Bradford and John Broderick, March 5, 1937. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Plan of Office Unit at Glenn Dale, 1937. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426. Pencil note on verso: "Original plan of office unit as prepared by B.Y. Morrison."

General Plans, U.S.D.A., Greenhouse Drawings, Soil Conservation Service Plans by Metropolitan Greenhouse Manufacturing Corporation, June 30, 1937. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Details of An Electrically Heated, Insect Proof Propagating Case, n.d. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Glenn Dale Map, September 5, 1937. Revised with utilities update, January 17, 1958. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Glenn Dale Map, September 5, 1937. Revised with construction dates of buildings, 1959. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Map of Glenn Dale Site, April 25, 1938. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Plot Designations, Plant Introduction Garden, Bell, MD, drawn by Geo. A. Wood, August 25, 1938. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Headhouse and Greenhouse at Glenn Dale, MD, May 5, 1948. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Headhouse and Greenhouse at Glenn Dale, Lord & Burnham Co., Irvington, NY, Walter G. Cadmus, Architect, Beltsville, MD, September 9, 1948. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Seed Storage Building, August 1949. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Air Conditioning System, Seed Storage Building, March 1950. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Greenhouse Addition for the Plant Introduction Garden, Glenn Dale, MD, March 21, 1957. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

New Woodwork for Existing Greenhouse at Plant Introduction Station, Glenn Dale, MD, Horticultural Crops Research Branch, May 1, 1957. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Greenhouse Construction Drawings [addition to Quarantine Greenhouse #3, Building 31]; Perry & Wallis, Inc., D.C.; American-Moninger Greenhouse Manufacturing Company (two sets), August 1957. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Glenn Dale Plat Plan for the New Crops Research Branch, August 1959. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Tracing of 1937 Building Location Map, August 1959. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Boiler Floor Slab, Building #4, Glenn Dale, MD, March 15, 1968. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Baltimore Gas & Electric, Poles Removed and Replaced, September 14, 1970. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Reroofing of Building #4 Headhouse, May 31, 1973. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Plant Introduction Station, Glenn Dale, MD, drawn by W.L. Ackerman, August 1973. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Topographic Survey of Glenn Dale Area, March 26, 1974. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Greenhouse #3, Building #7 Reconstruction, February 15, 1977. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Topographic Survey of Glenn Dale Area, March 1977. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

U.S. Plant Introduction Station, Glenn Dale, MD, drawing by R.J. Finch, November 25, 1977. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Glenn Dale Building #4 and Seed Storage; Greenhouses & Shop, Buildings #5 through #20, February 27, 1978. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Glenn Dale Greenhouses #24 through #31, February 27, 1978. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Reskin Greenhouses #4 and #5, April 3, 1978. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Chain Link Fence along Pond Drive Road at Plant Introduction Station, Glenn Dale, MD, June 9, 1978. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Gas Lines, Buildings 27 & 30, June 1979. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

USDA Seed Storage Building Electrical Plan, August 15, 1979. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Install Lights & Outlet in Greenhouses #4 and #5, March 26, 1980. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Site Improvements at Cottage #2 (Secret Service), 1982. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Reskin Greenhouse Structures 6, 7, 9 and Repair Headhouse, April 25, 1984. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Install Ladies Shower at Cottage #2 (Secret Service), April 23, 1985. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Plant Introduction Station, Glenn Dale, MD [Building Numbers Noted], October 2, 1987. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Automatic Irrigation System, Trickl-eez Company, Biglerville, PA, July 1988. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Plant Introduction Station, Heating System Modification, n.d. [ca. 1979?] Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

New Plastic Greenhouses, Glenn Dale, August 20, 1989. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Prefabricated Buildings at Glenn Dale (for the U.S. National Arboretum), August 29, 1991. Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.

B. Historic Views

View of the Main Office (Buildings 1, 2, 3), U.S. Plant Introduction Station, Glenn Dale, MD, ca. 1950. [3 photographs mounted together]. Office of Facilities Engineering Branch, Beltsville Agricultural Research Center, Building 426.

Construction of the Headhouse, U.S. Plant Introduction Station, Glenn Dale, MD, May 1920. Office of Dr. Waterworth, Building 27, Glenn Dale.

The Headhouse, U.S. Plant Introduction Station, Glenn Dale, MD, August 1920. Office of Dr. Waterworth, Building 27, Glenn Dale.

The Headhouse and Greenhouses, looking north, U.S. Plant Introduction Station, Glenn Dale, MD, May 1920. Office of Dr. Waterworth, Building 27, Glenn Dale.

The Headhouse and Greenhouses, looking southwest, U.S. Plant Introduction Station, Glenn Dale, MD, May 1920. Office of Dr. Waterworth, Building 27, Glenn Dale.

View of the U.S. Plant Introduction Station, looking north, with two cottages visible, Glenn Dale, MD, May 1920. Office of Dr. Waterworth, Building 27, Glenn Dale.

C. Interviews

Dr. William L. Ackerman, telephone interview, by Heather Ewing, Robinson & Associates, Inc., June 9, 1995; site visit at Glenn Dale, October 30, 1996. Ackerman was Superintendent at Glenn Dale (1959-1974).

Barbara Bullock, telephone interview, by Heather Ewing, Robinson & Associates, inc., December 1996. Bullock is curator of Azaleas at the U.S. National Arboretum (1990-).

Dr. John L. Creech, telephone interview, by Heather Ewing, Robinson & Associates, Inc., June 14, 1995; November 22, 1996. Creech was Superintendent at Glenn Dale (1948-1959).

Dr. Daniel E. Kugler, telephone interview, by Heather Ewing, Robinson & Associates, Inc., January 29, 1997. Kugler is with the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture.

William Miller, telephone interview by Heather Ewing, Robinson & Associates, Inc., December 1996. Miller is with the Azalea Society of Washington, D.C.

Dr. Howard E. Waterworth, interviews conducted at Glenn Dale, MD, by Heather Ewing, Robinson & Associates, Inc., May 18, 1995; September 30 and October 30, 1996. Waterworth is the former superintendent of the station, currently Supervisory Plant Pathologist, National Plant Germplasm Quarantine Laboratory (at Glenn Dale 1964-November 1996; now at Beltsville).

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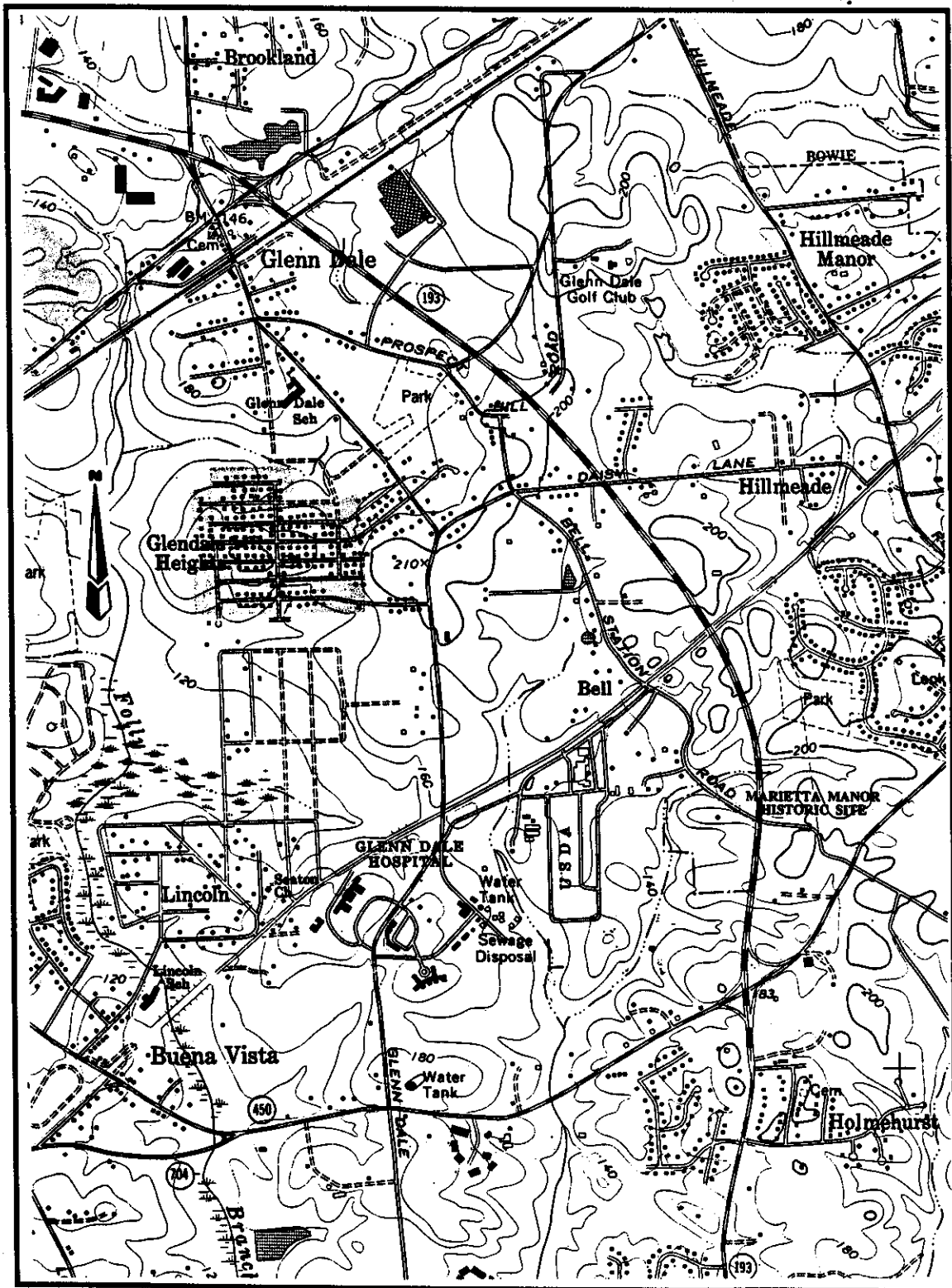
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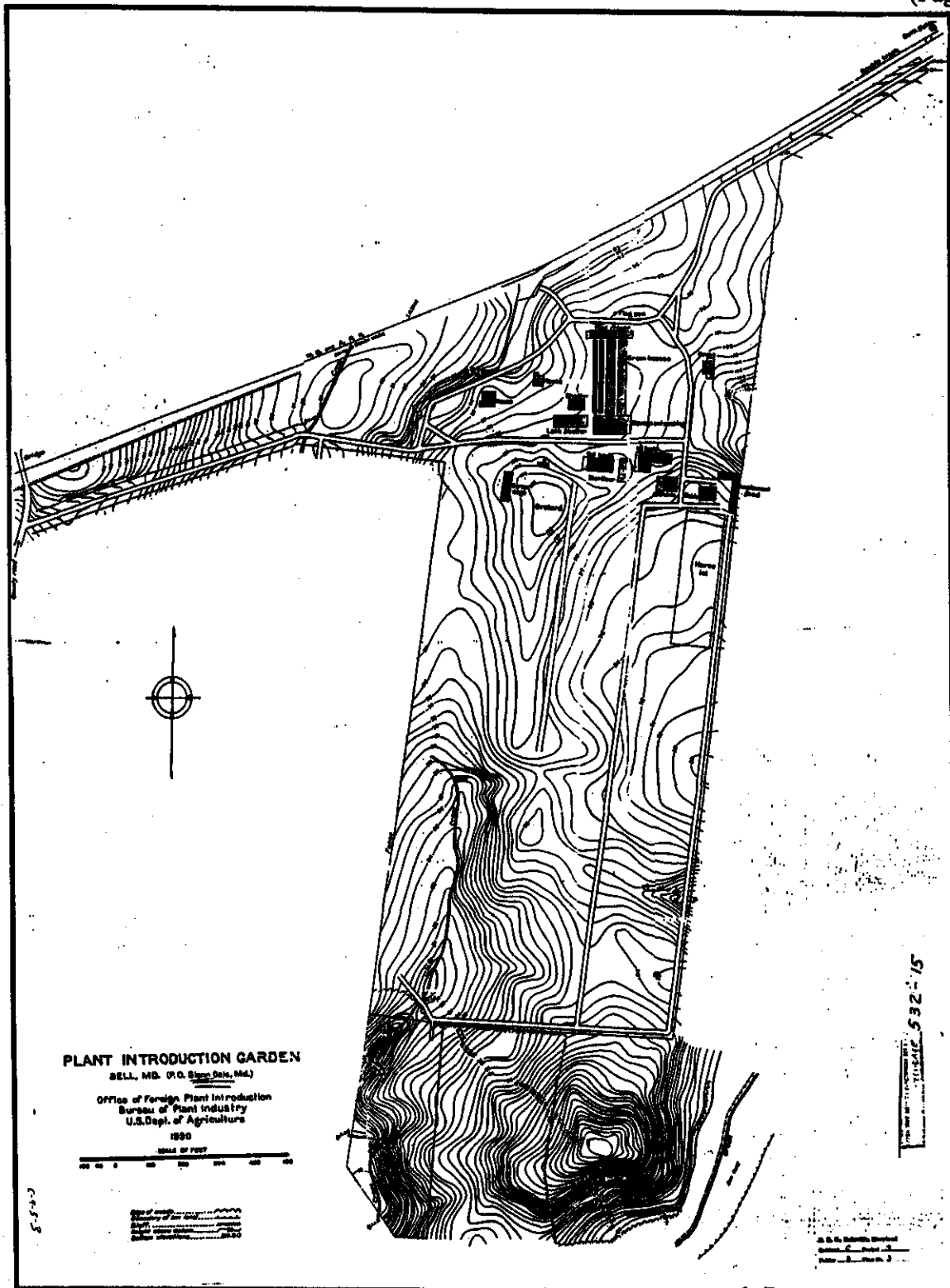
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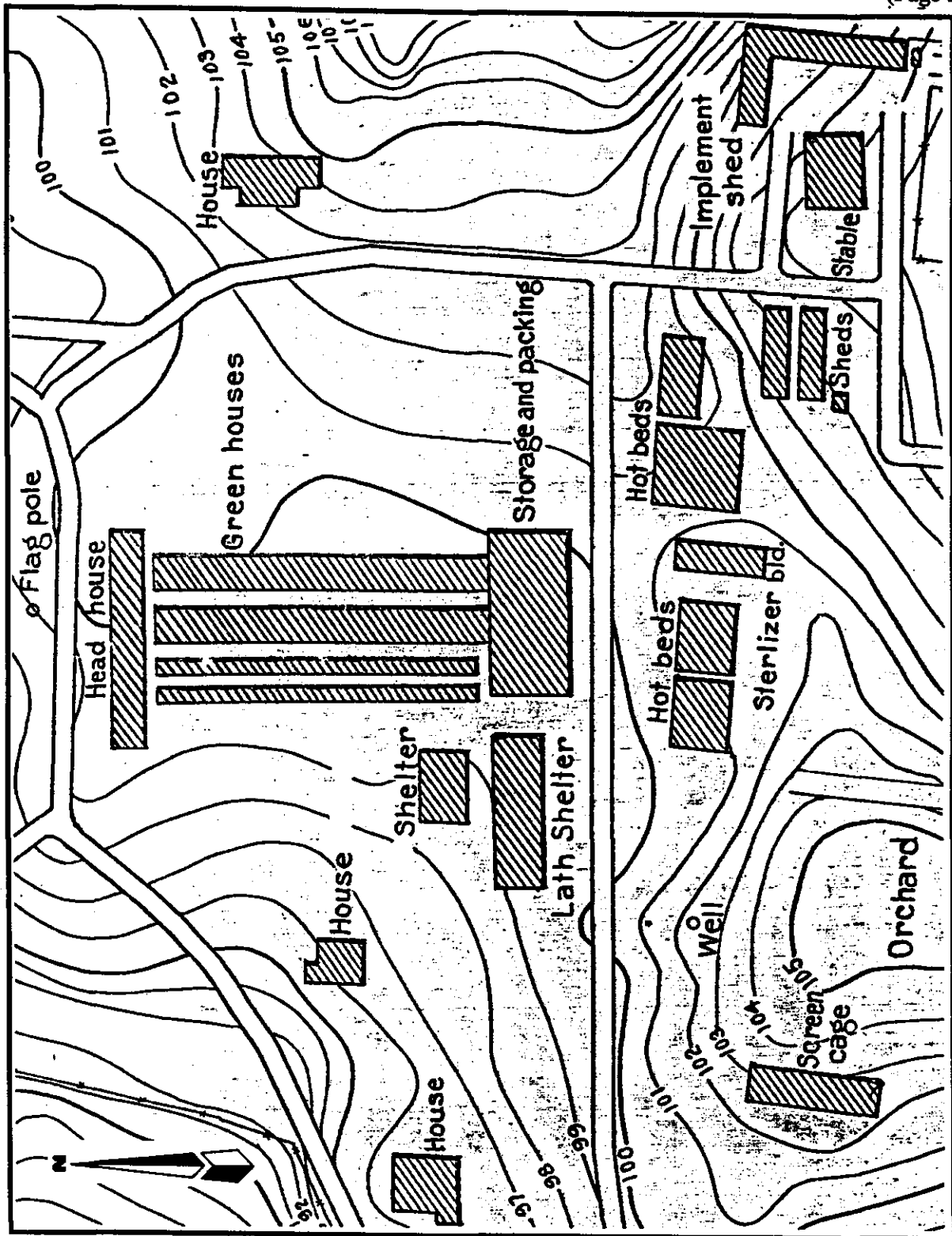
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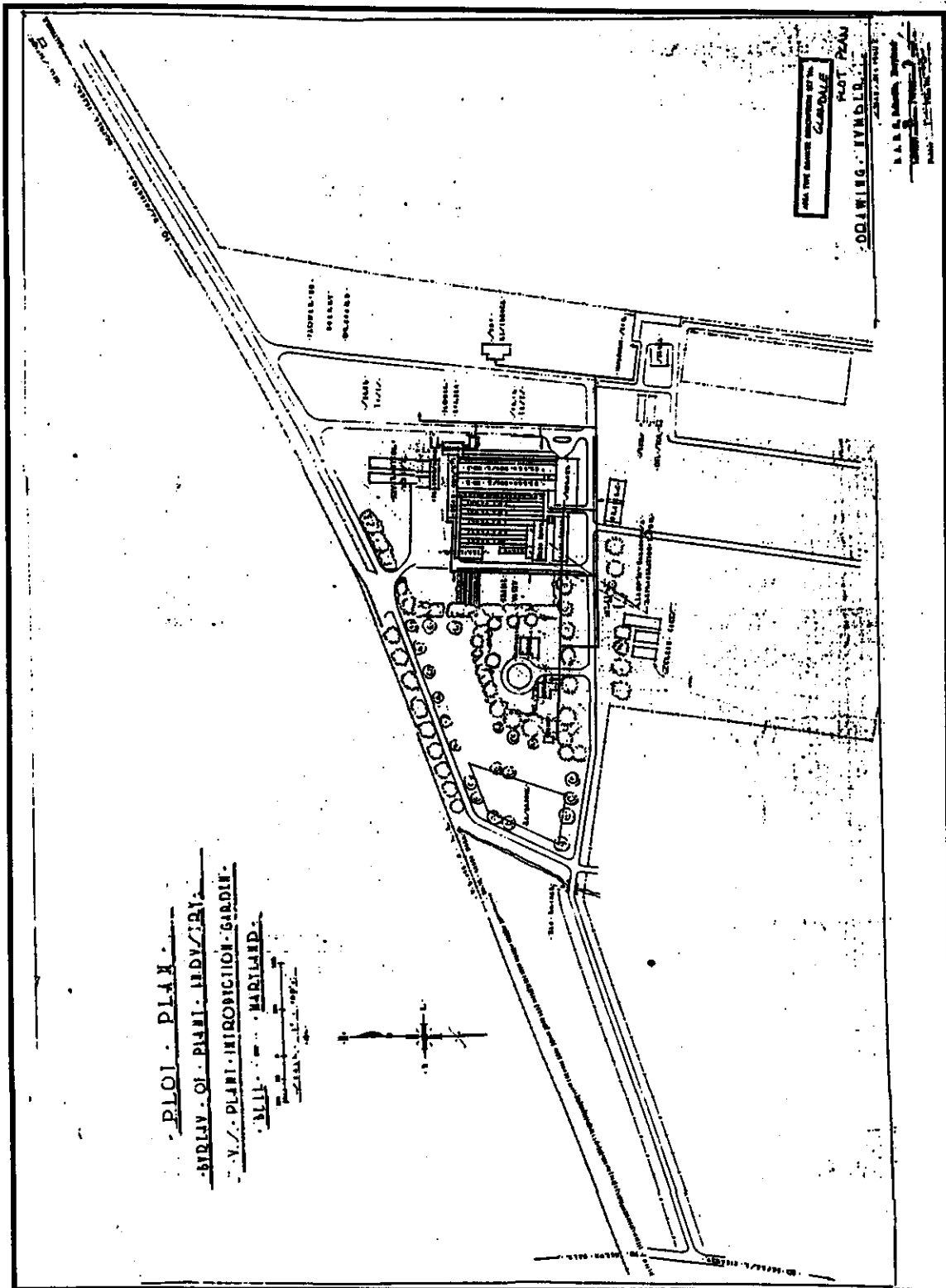
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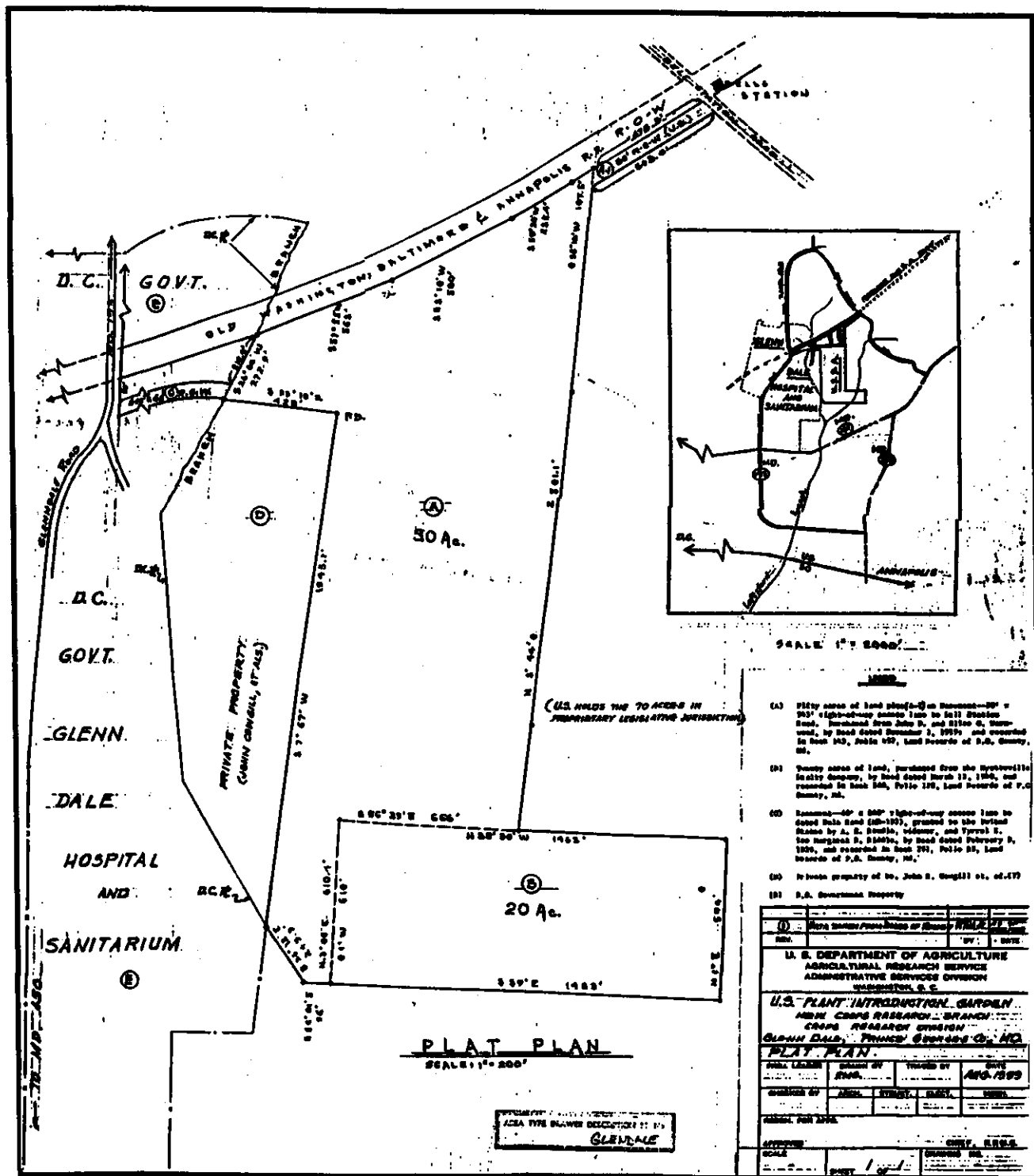
Site Plan, 1930. Source: Facilities and Engineering Branch, Beltsville Agricultural Research Center, Building 426.



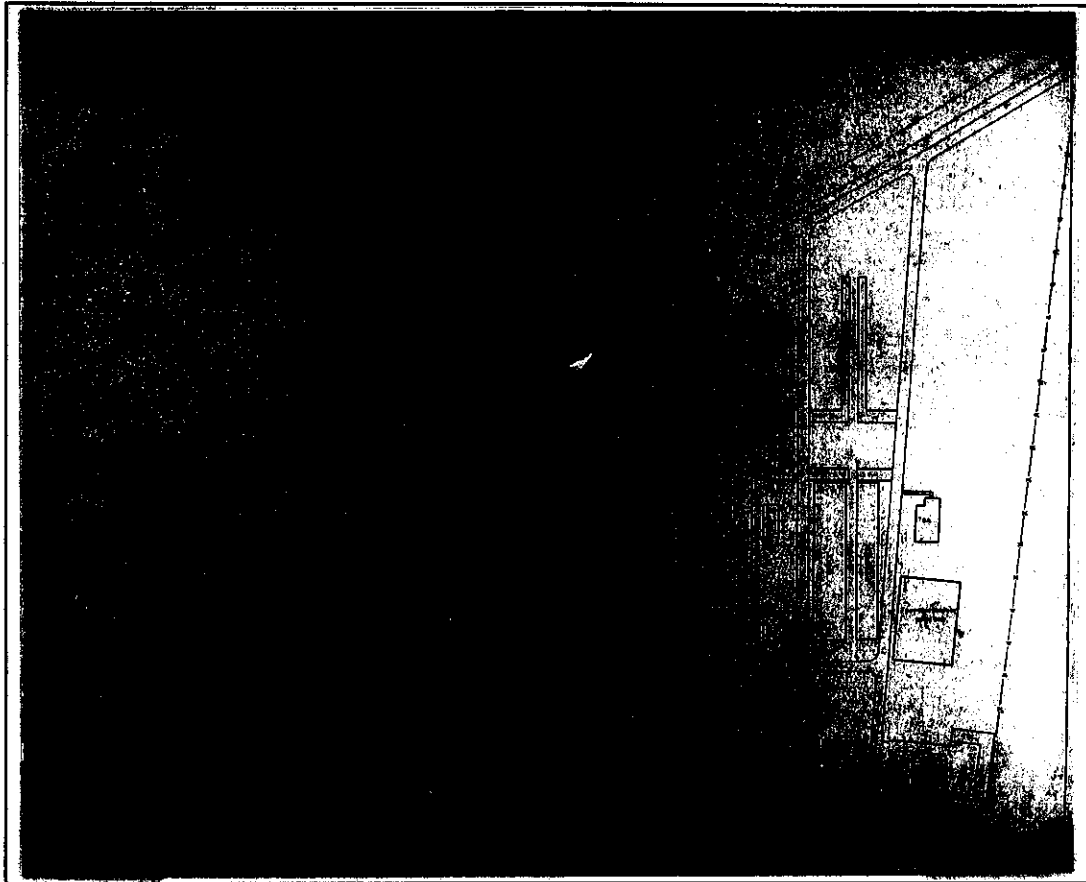
Detail, Site Plan, 1930. Source: Facilities and Engineering Branch, Beltsville Agricultural Research Center, Building 426.



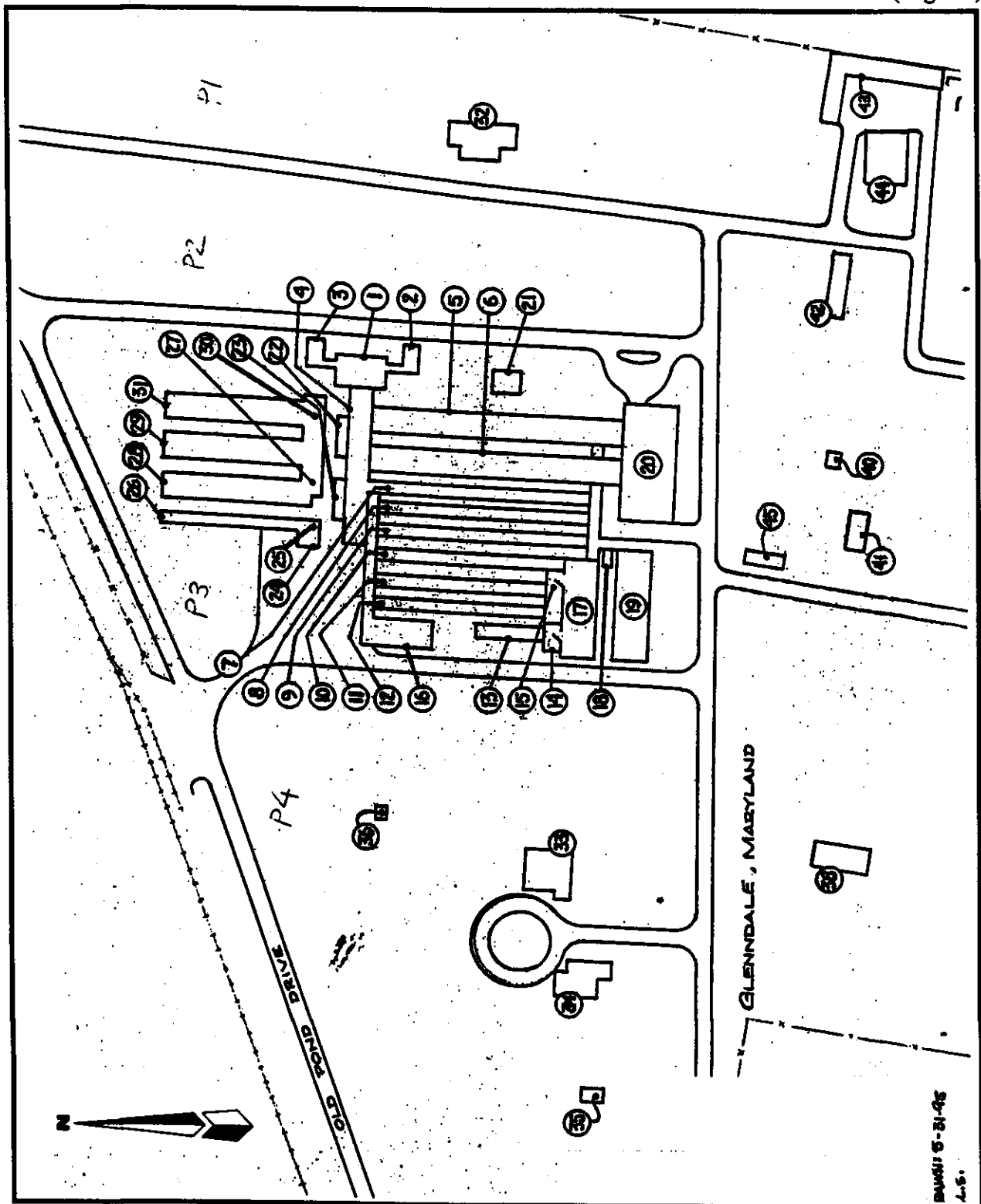
Site Plan, 1935. Source: Facilities and Engineering Branch, Beltsville Agricultural Research Center, Building 426.



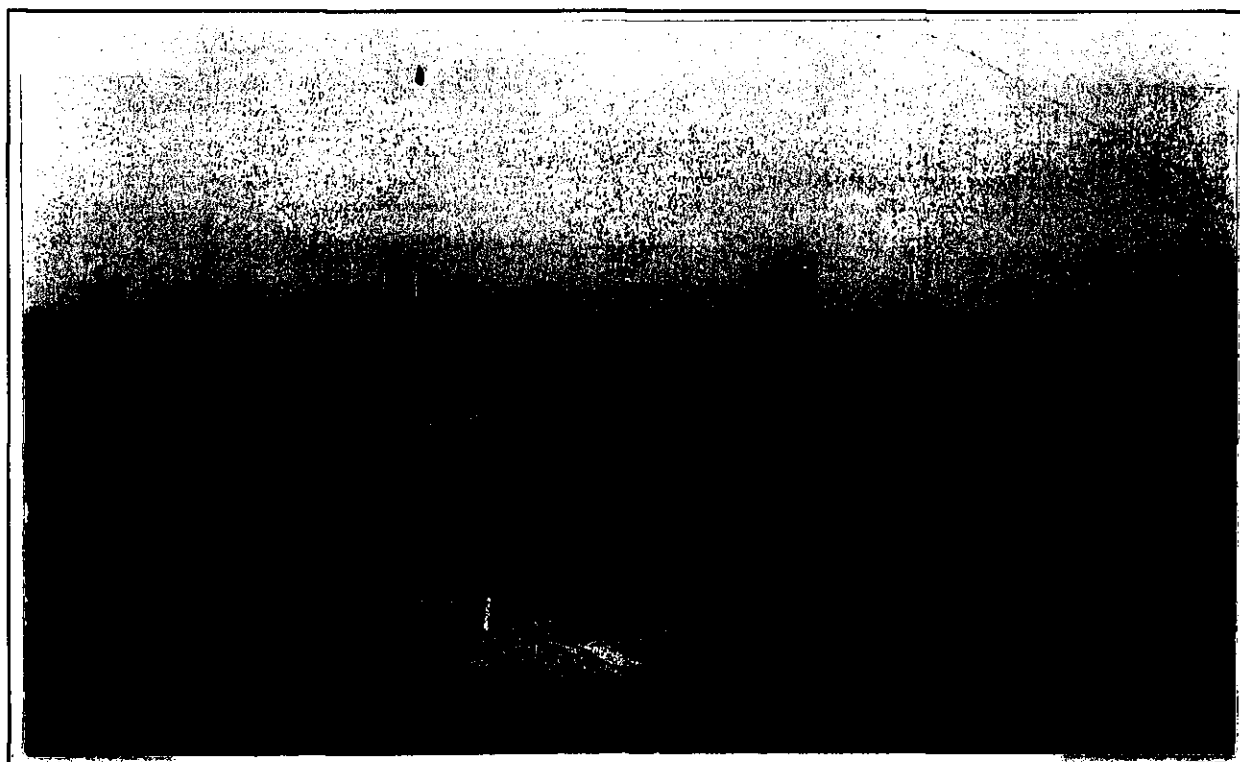
Site plan of the U.S. Plant Introduction Station, Glenn Dale, Maryland, 1959. Source: Division of Facilities and Engineering, Building 426, Beltsville Agricultural Research Center, Beltsville, Maryland.



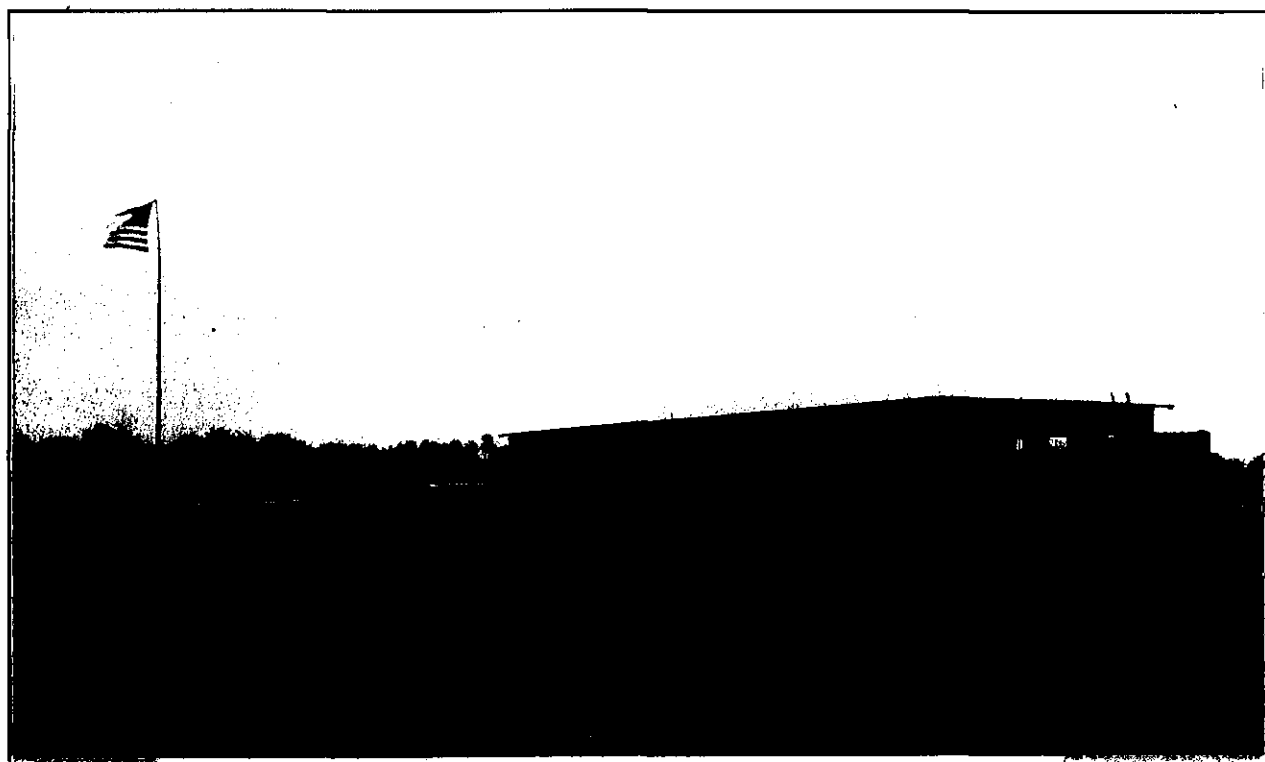
Site Plan of Building Area, with key to building names and numbers, and nursery plots, August 1959.
Source: Facilities and Engineering Branch, Beltsville Agricultural Research Center, Building 426.



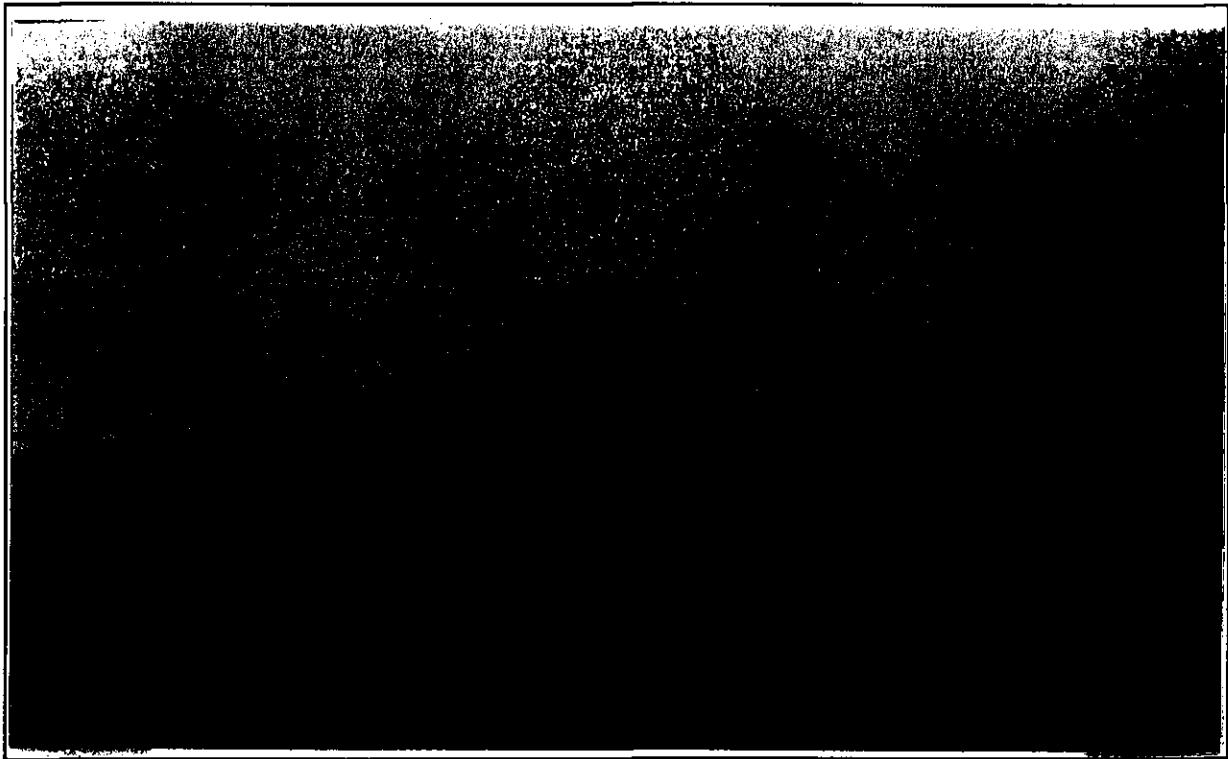
Site Plan with numbered buildings, 1995. Source: Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426. Drawing by B. Siehl.



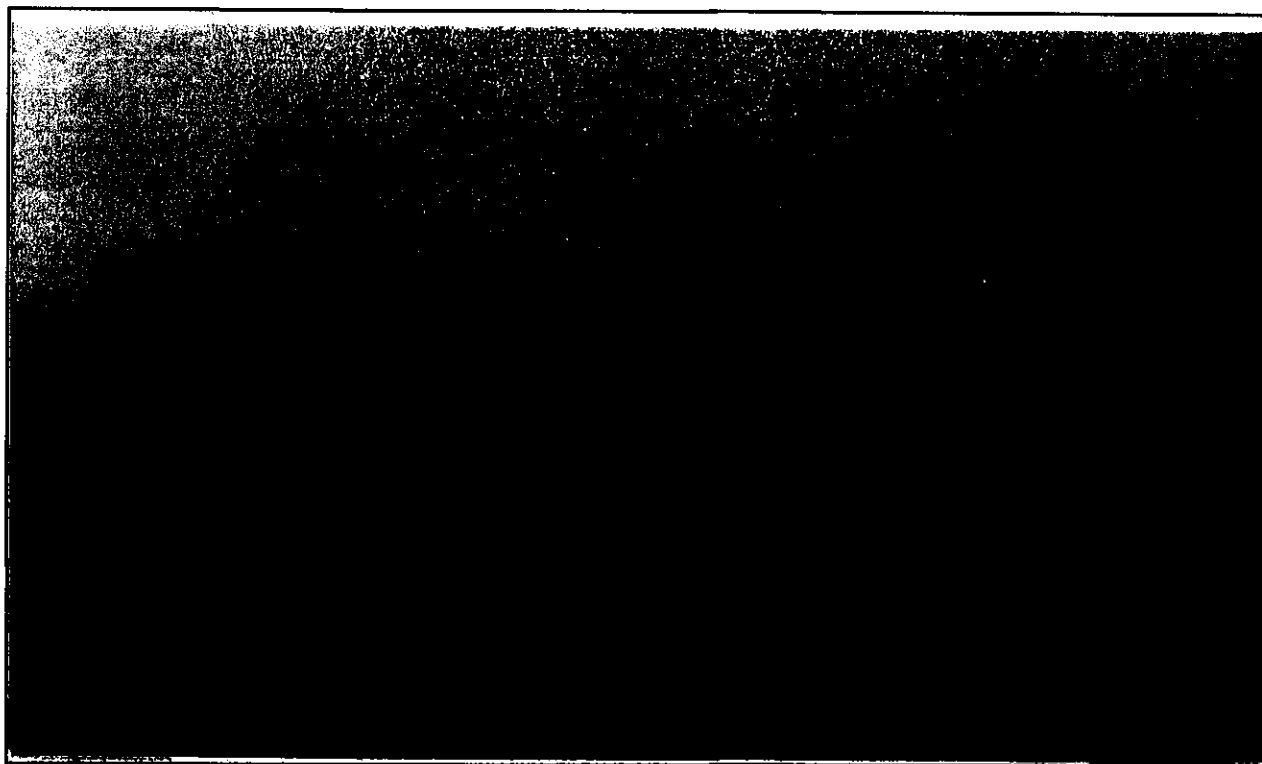
Construction of the Headhouse, 1919-1920. Source: Dr. Howard Waterworth, Beltsville Agricultural Research Center; copy in the National Agricultural Library, Special Collections.



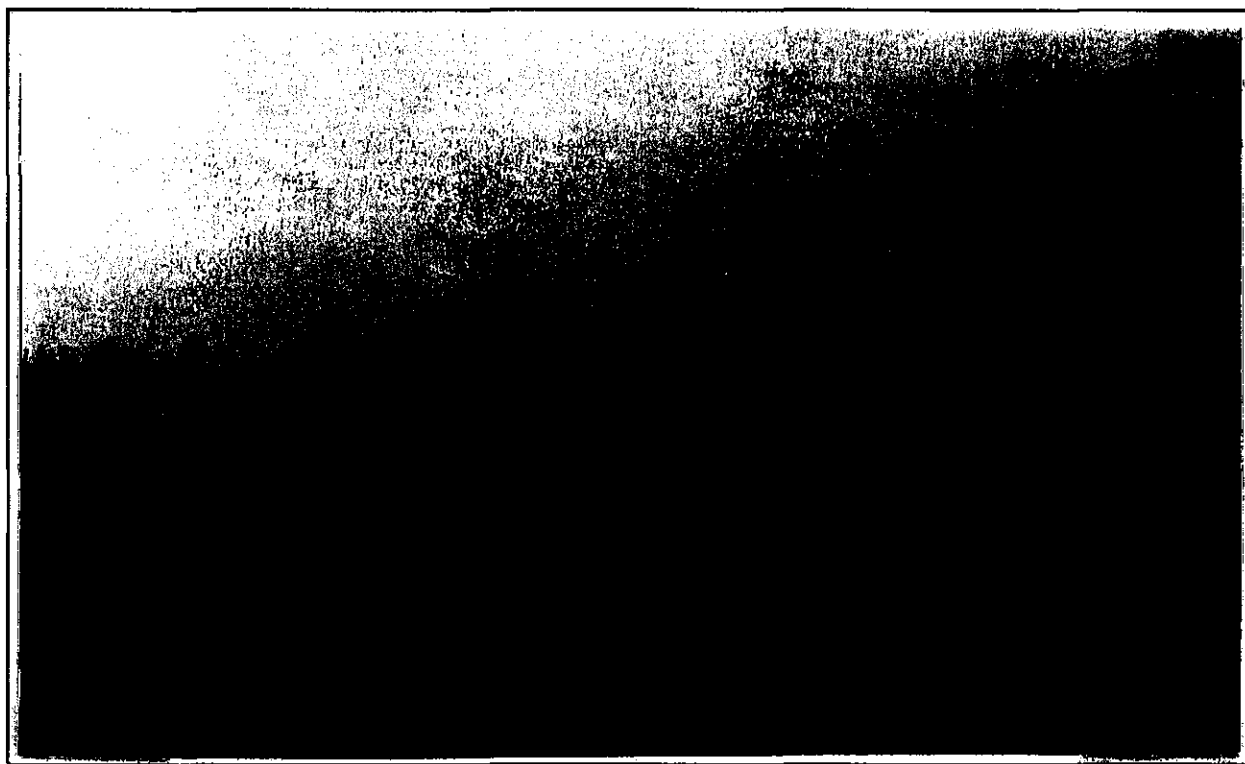
The Headhouse, 1919-1920. Source: Dr. Howard Waterworth, Beltsville Agricultural Research Center; copy in the National Agricultural Library, Special Collections.



The Headhouse (Building 4) and Greenhouses (Buildings 5 and 6), looking southwest, 1920.
Source: Dr. Howard Waterworth, Beltsville Agricultural Research Center; copy in the National
Agricultural Library, Special Collections.



The Greenhouses (Buildings 5 and 6) and Headhouse (Building 4), looking north, 1920.
Source: Dr. Howard Waterworth, Beltsville Agricultural Research Center; copy in the National
Agricultural Library, Special Collections.



View of the U.S. Plant Introduction Station, looking north, with cottages visible at perimeters, 1920.
Source: Dr. Howard Waterworth, Beltsville Agricultural Research Center; copy at the National
Agricultural Library, Special Collections.

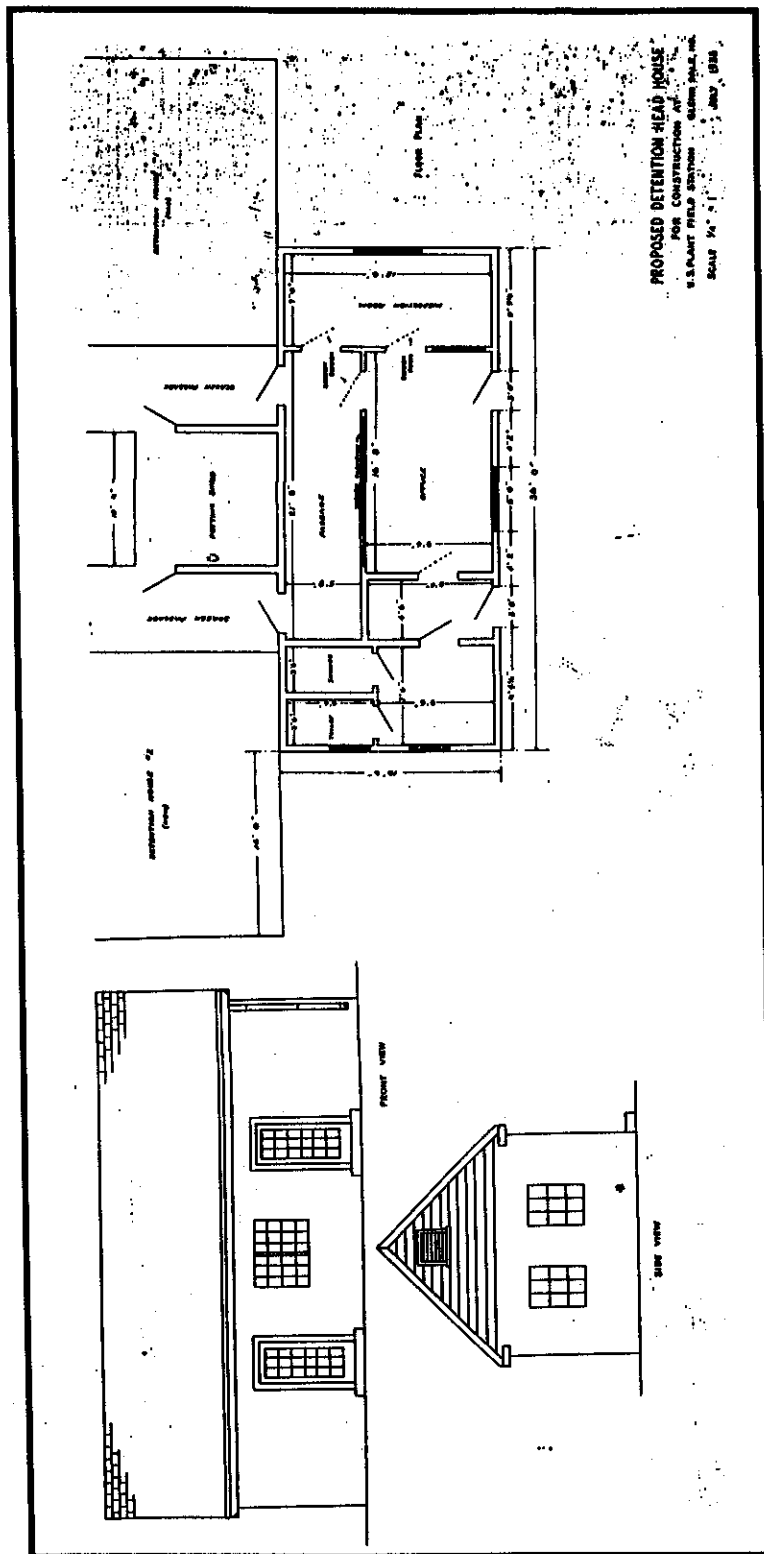


CHAULMOOGRA PLANTS, SOURCE OF THE DRUG BELIEVED TO CURE LEPROSY.

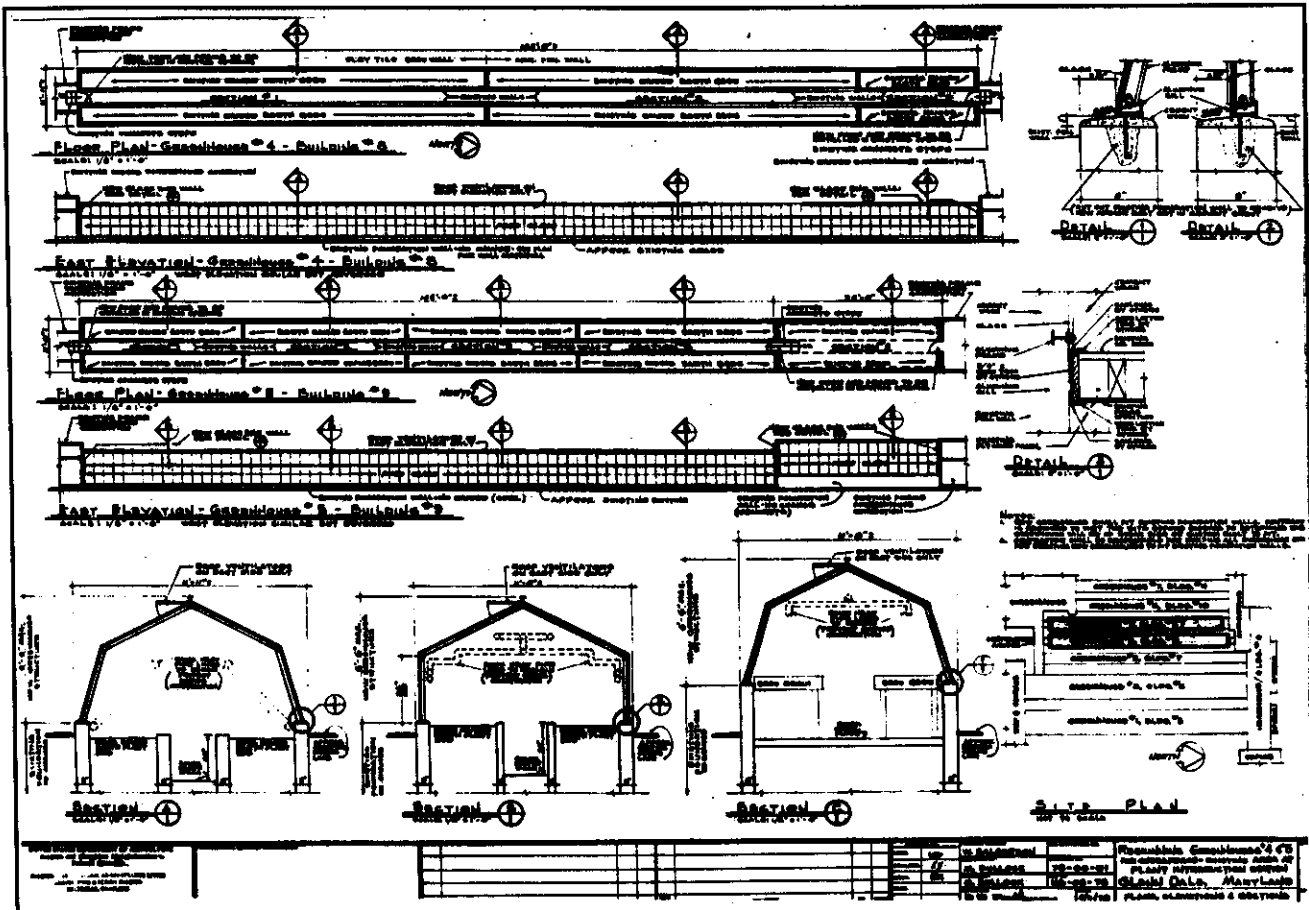
(*Taraktogenos kurzii* King; S. P. I. No. 56633.)

The adventurous journey of Agricultural Explorer J. F. Rock in search of the chaulmoogra tree, source of a drug which repeated experiments have shown to possess immense value in the treatment of leprosy, not only resulted in clearing up the mystery which surrounded the identity of this plant but furnished supplies of seeds by means of which it is hoped to establish chaulmoogra plantations in Hawaii and elsewhere. Three thousand young plants, shown above in one of the greenhouses at the Plant Introduction Garden, Bell, Md., have been grown during the past season and are being distributed widely in tropical countries. (Photographed by Wilson Popenoe, August 27, 1923; P35027FS.)

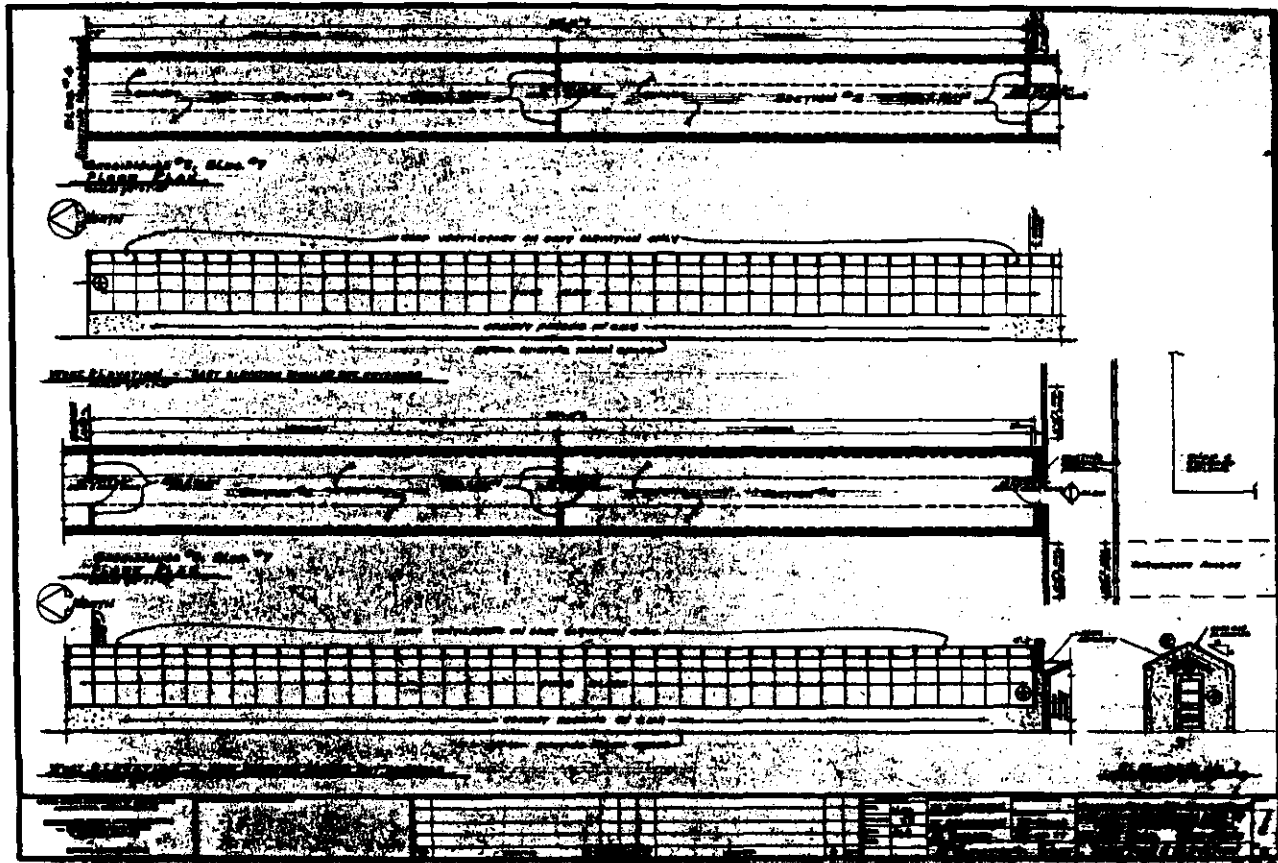
J.F. Rock and the chaulmoogra plants in Greenhouse #1 or #2 (Building 5 or 6), photographed by Wilson Popenoe, 1923. Source: *Plant Immigrants*, No. 215, March 1924.



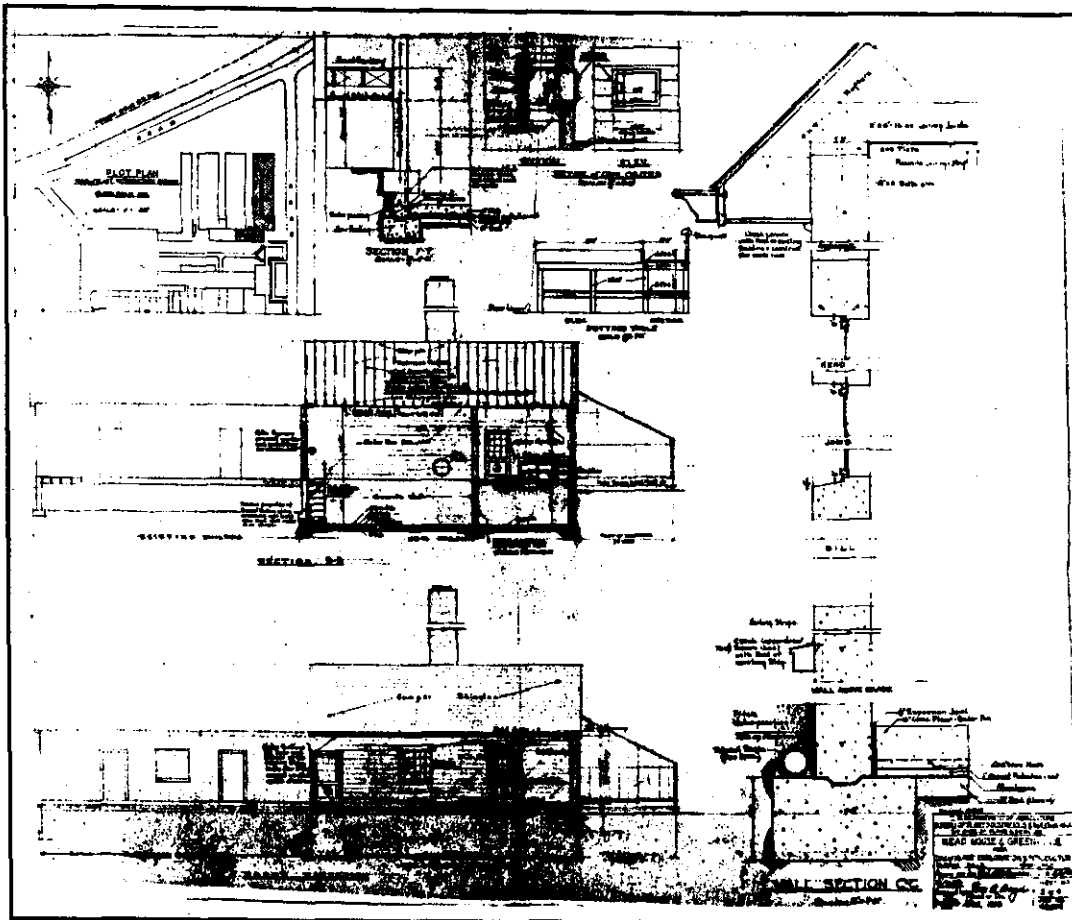
Quarantine Headhouse (Building 27), 1933. Source: Facility Engineering Branch, Beltsville Agricultural Research Center, Building 426.



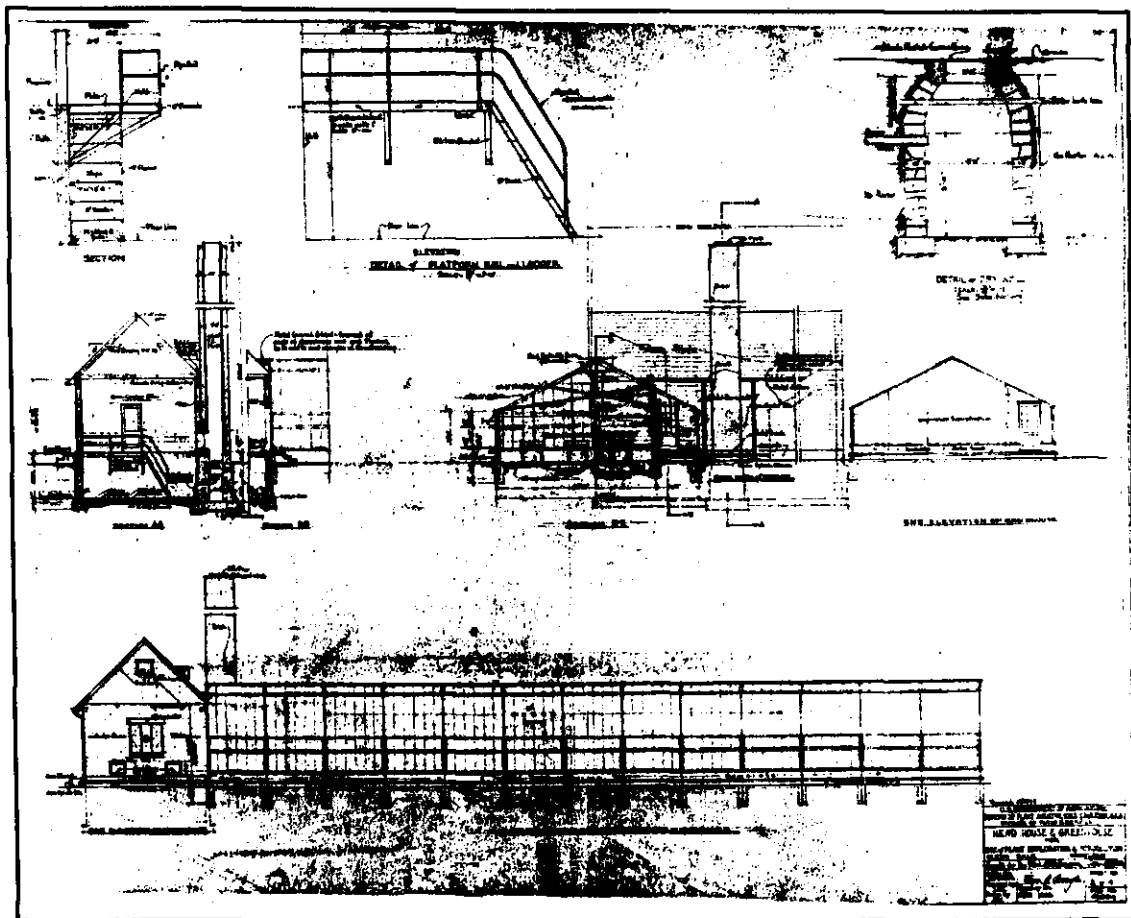
East Elevation, Section, and Floor Plan, Reskinning Greenhouses #4 and #5 (Buildings 8 and 9), April 1978. Source: Facilities and Engineering Branch, Beltsville Agricultural Research Center, Building 426.



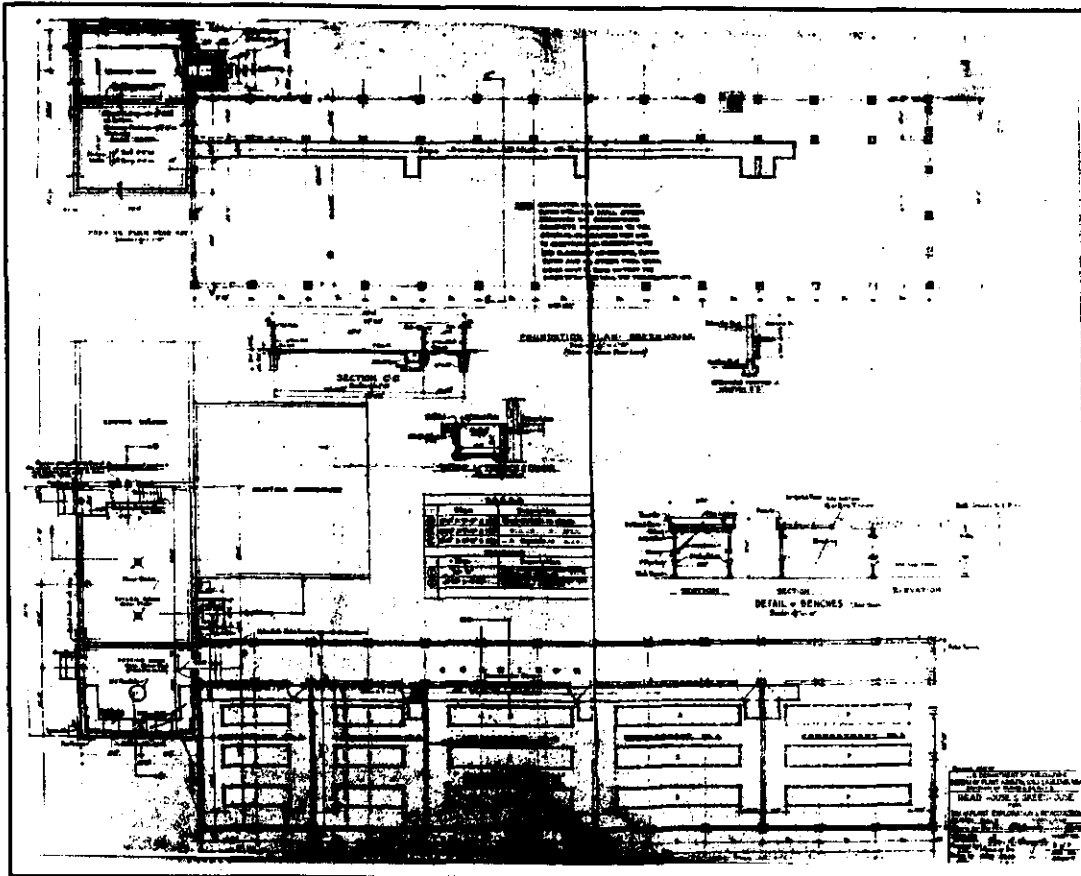
West Elevation and Floor plan, Reconstruction of Greenhouse #3 (Building 7), August 1977. Source: Facilities and Engineering Branch, Beltsville Agricultural Research Center, Building 426.



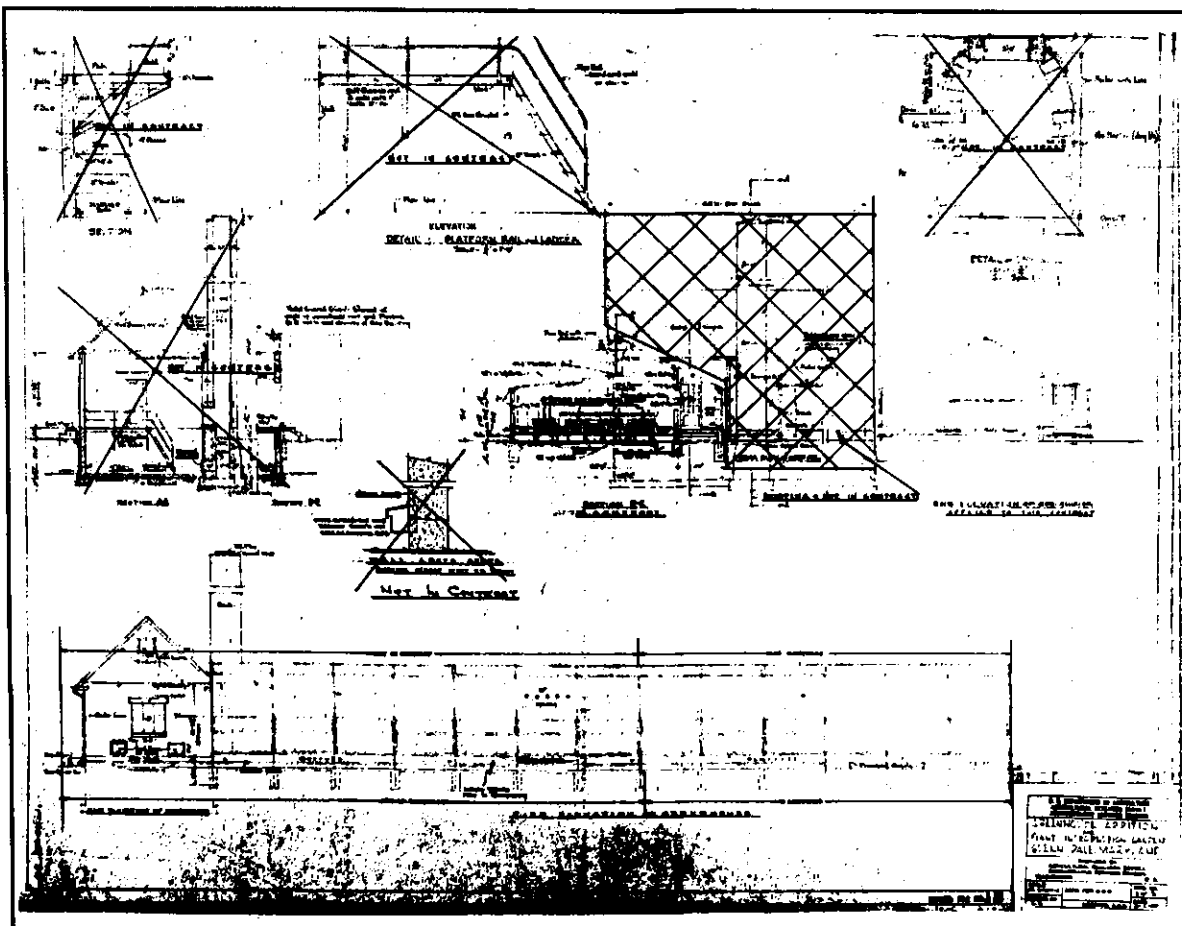
Front Elevation and Section of Quarantine Headhouse and Greenhouse (Buildings 30 and 31), May 1948. Source: Facilities and Engineering Branch, Beltsville Agricultural Research Center, Building 426.



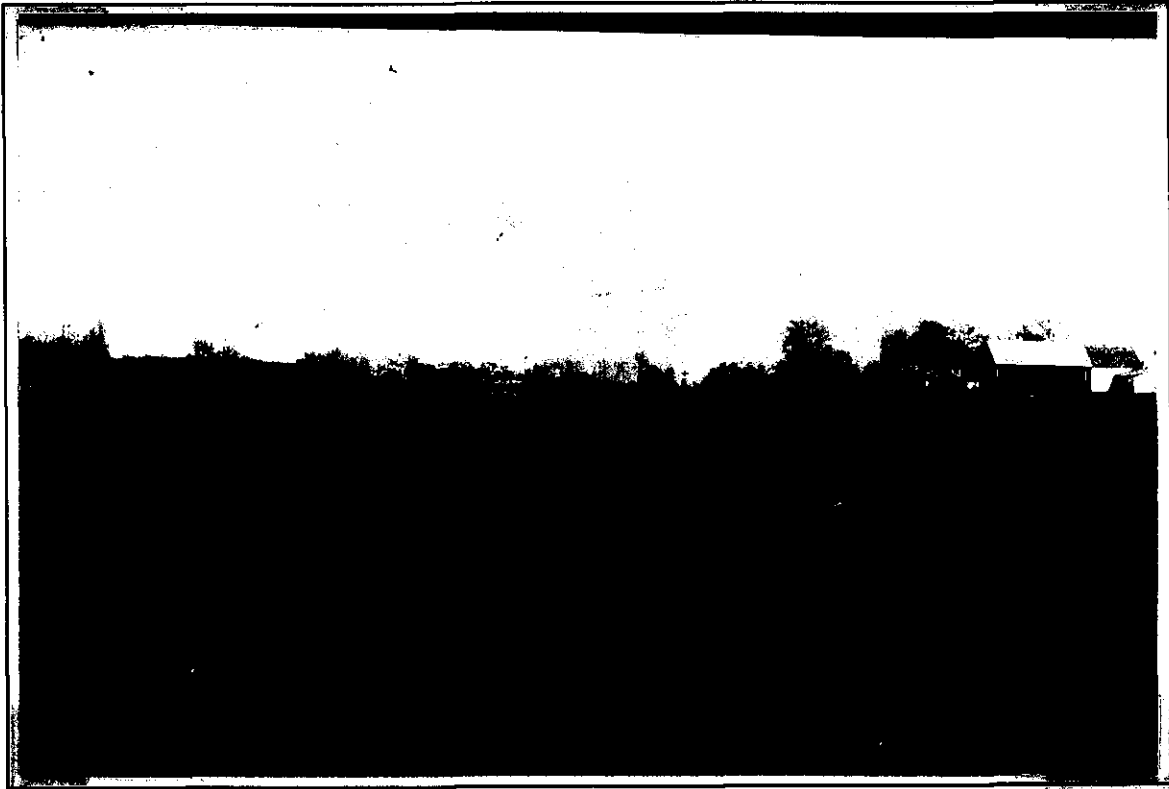
Side and End Elevations of Quarantine Headhouse and Greenhouse (Buildings 30 and 31), May 1948.
Source: Facilities and Engineering Branch, Beltsville Agricultural Research Center, Building 426.



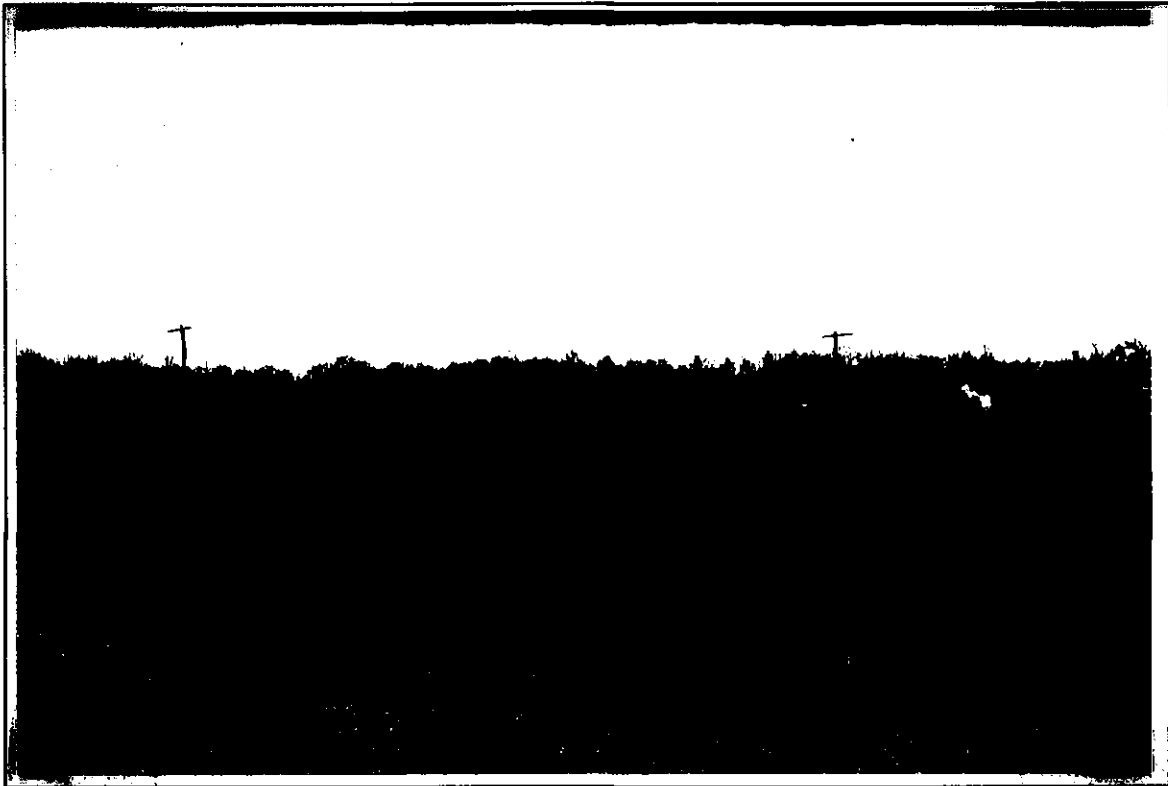
Floor Plan and Foundation Plan of Quarantine Headhouse and Greenhouse (Buildings 30 and 31), May 1948. Source: Facilities and Engineering Branch, Beltsville Agricultural Research Center, Building 426.



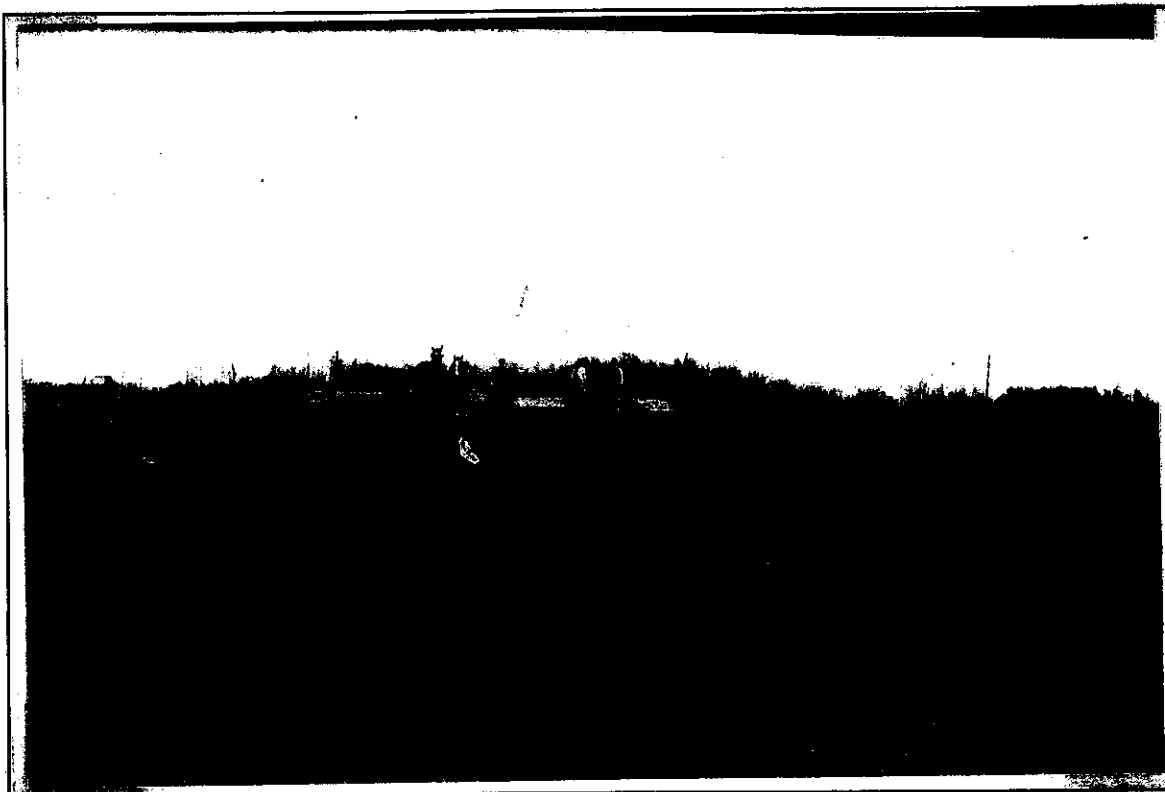
Side and End Elevations and Section of Greenhouse Addition (Building 31), March 1957. Source: Facilities and Engineering Branch, Beltsville Agricultural Research Center, Building 426.



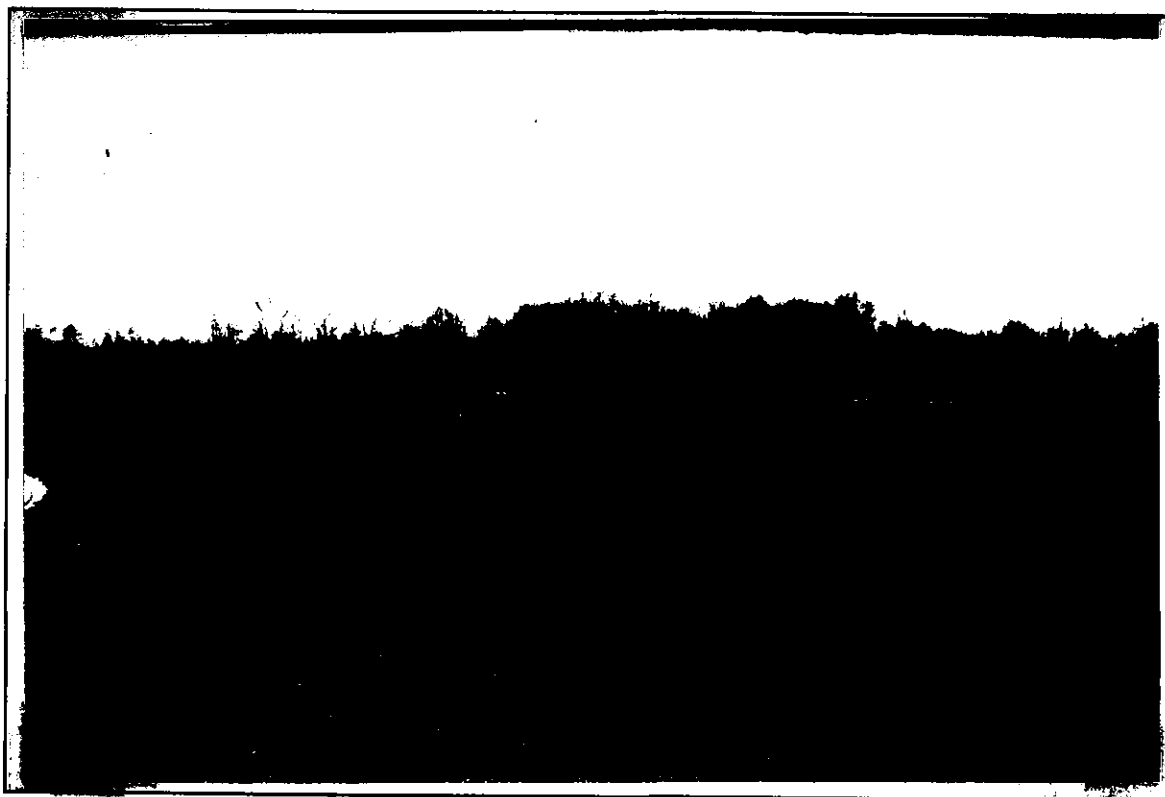
Photograph of the land at Bell Station under consideration by the Department of Agriculture, showing the Wormwood Farm, summer 1919. Source: National Archives and Records Administration, Entry 135F, Box 29.



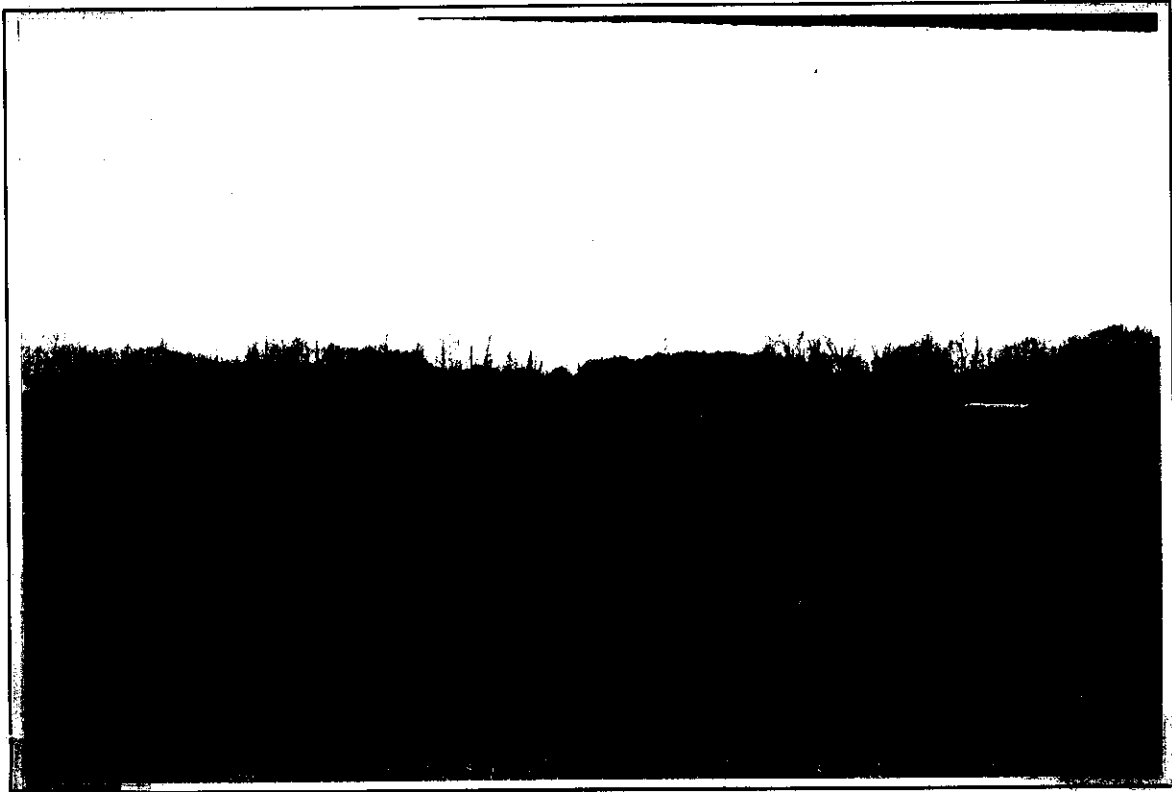
Photograph of the land at Bell Station under consideration by the Department of Agriculture, summer 1919. Source: National Archives and Records Administration, Entry 135F, Box 29.



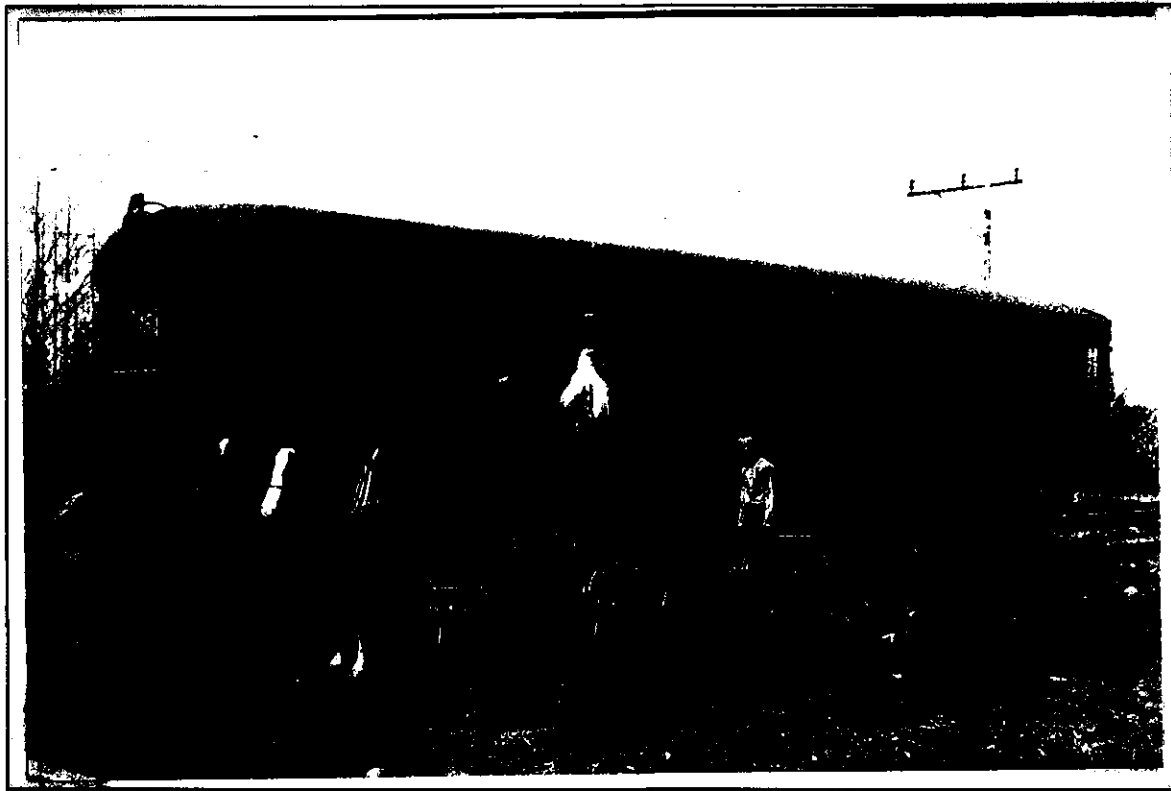
Photograph of the land at Bell Station under consideration by the Department of Agriculture, showing horses in the field, summer 1919. Source: National Archives and Records Administration, Entry 135F, Box 29.



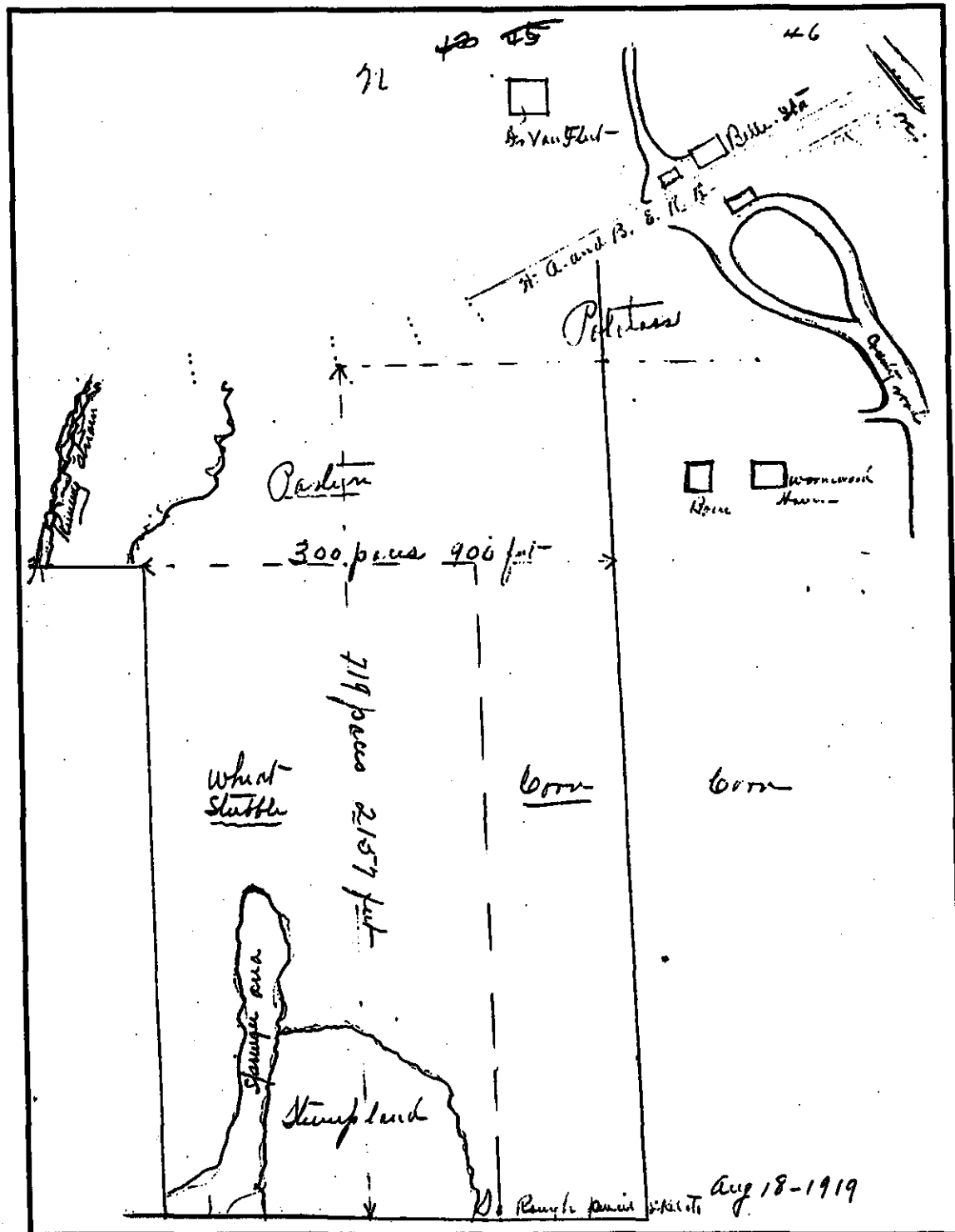
Photograph of the land at Bell Station under consideration by the Department of Agriculture, showing the Washington, Baltimore & Annapolis trolley, summer 1919. Source: National Archives and Records Administration, Entry 135F, Box 29.



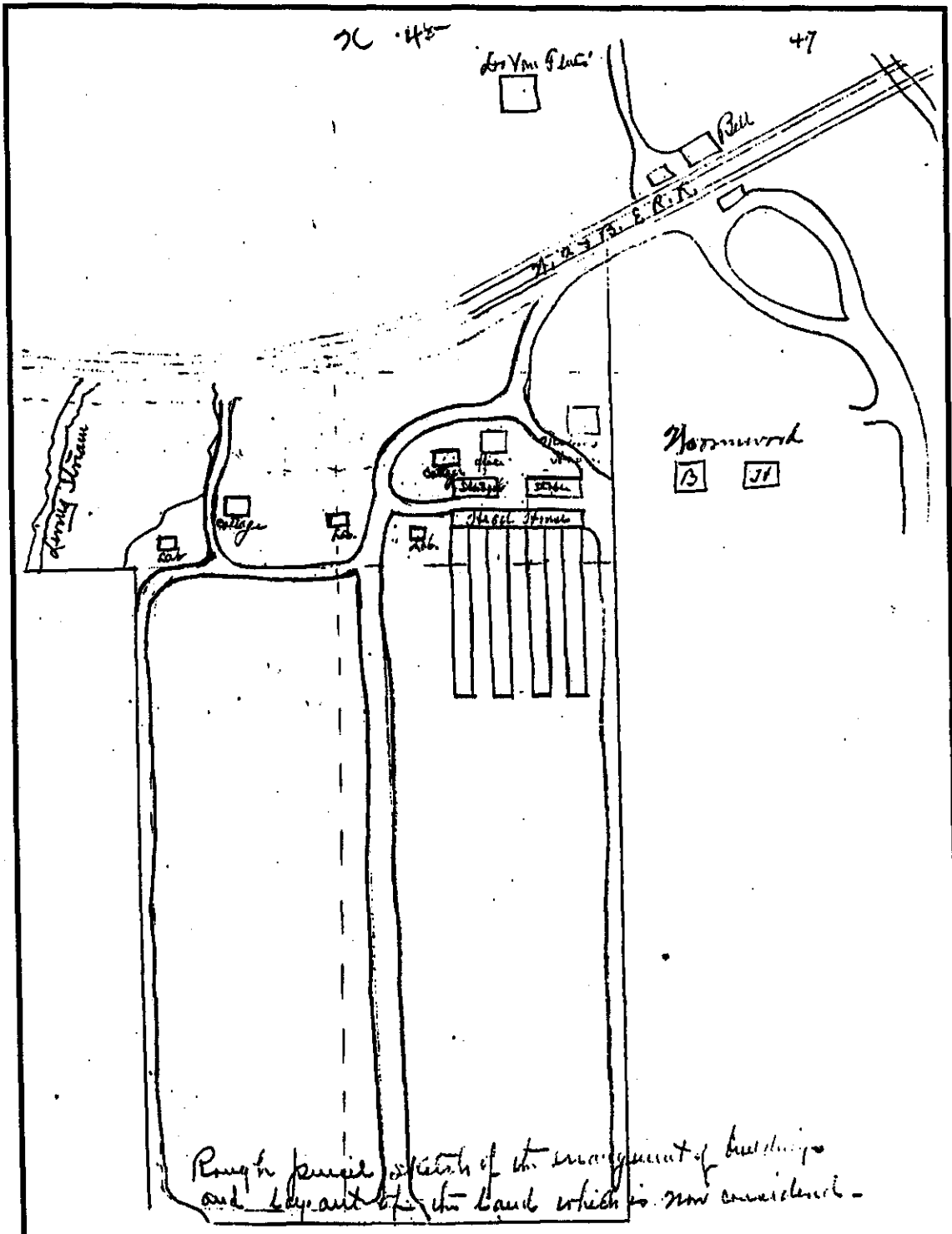
Photograph of the land at Bell Station under consideration by the Department of Agriculture, showing the Washington, Baltimore & Annapolis trolley, summer 1919. Source: National Archives and Records Administration, Entry 135F, Box 29.



Photograph of the Washington, Baltimore & Annapolis trolley at or near Bell Station, summer 1919.
Source: National Archives and Records Administration, Entry 135F, Box 29.



"Rough pencil sketch" executed by P.H. Dorsett, Foreign Seed and Plant Introduction, showing the condition of the land at Bell Station, August 18, 1919. Source: National Archives and Records Administration, Entry 135F, Box 29.



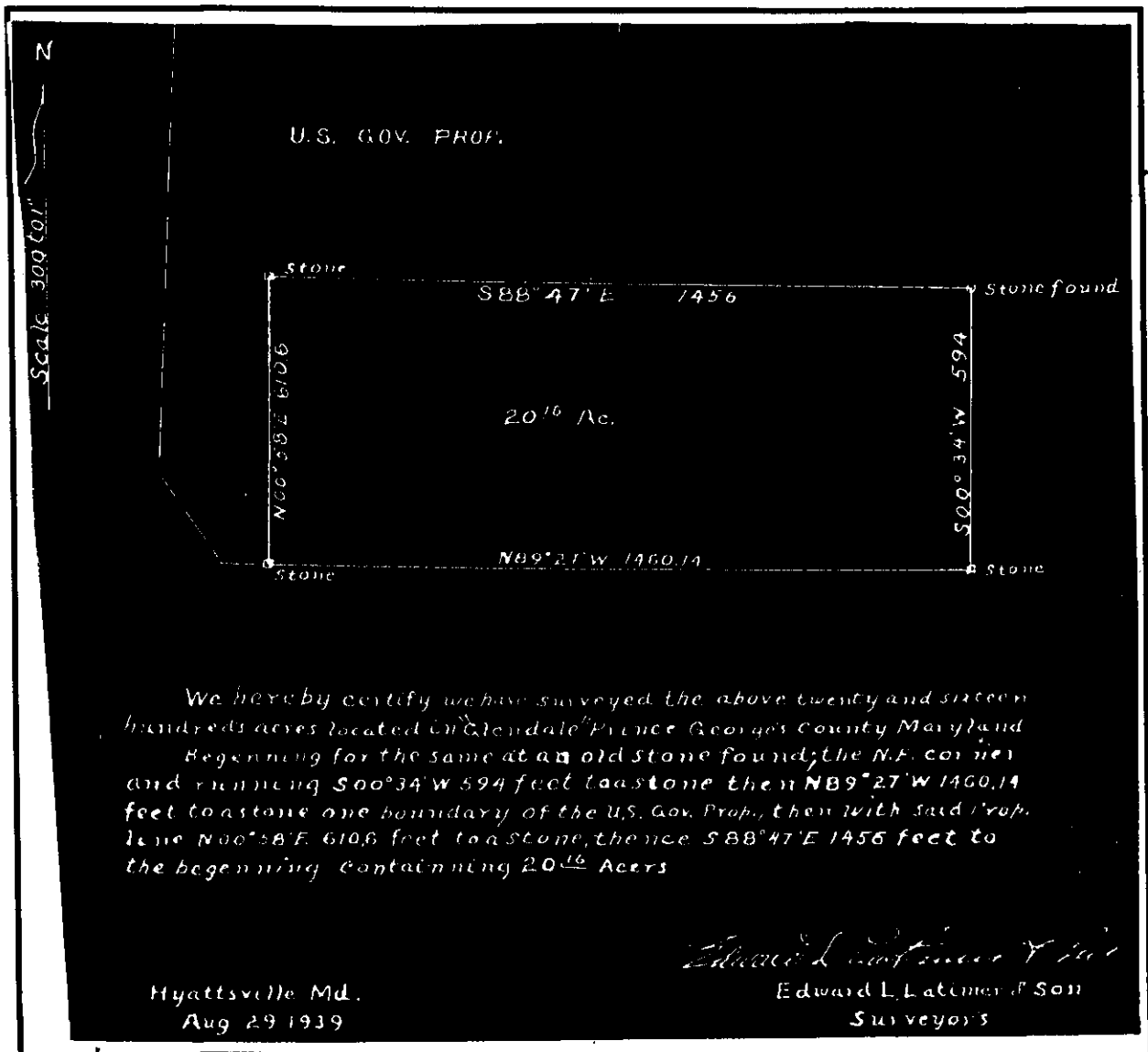
"Rough pencil sketch of the arrangement of buildings and layout of the land which is now considered," executed by P.H. Dorsett, Foreign Seed and Plant Introduction, n.d. [August 18, 1919]. Source: National Archives and Records Administration, Entry 135F, Box 29.



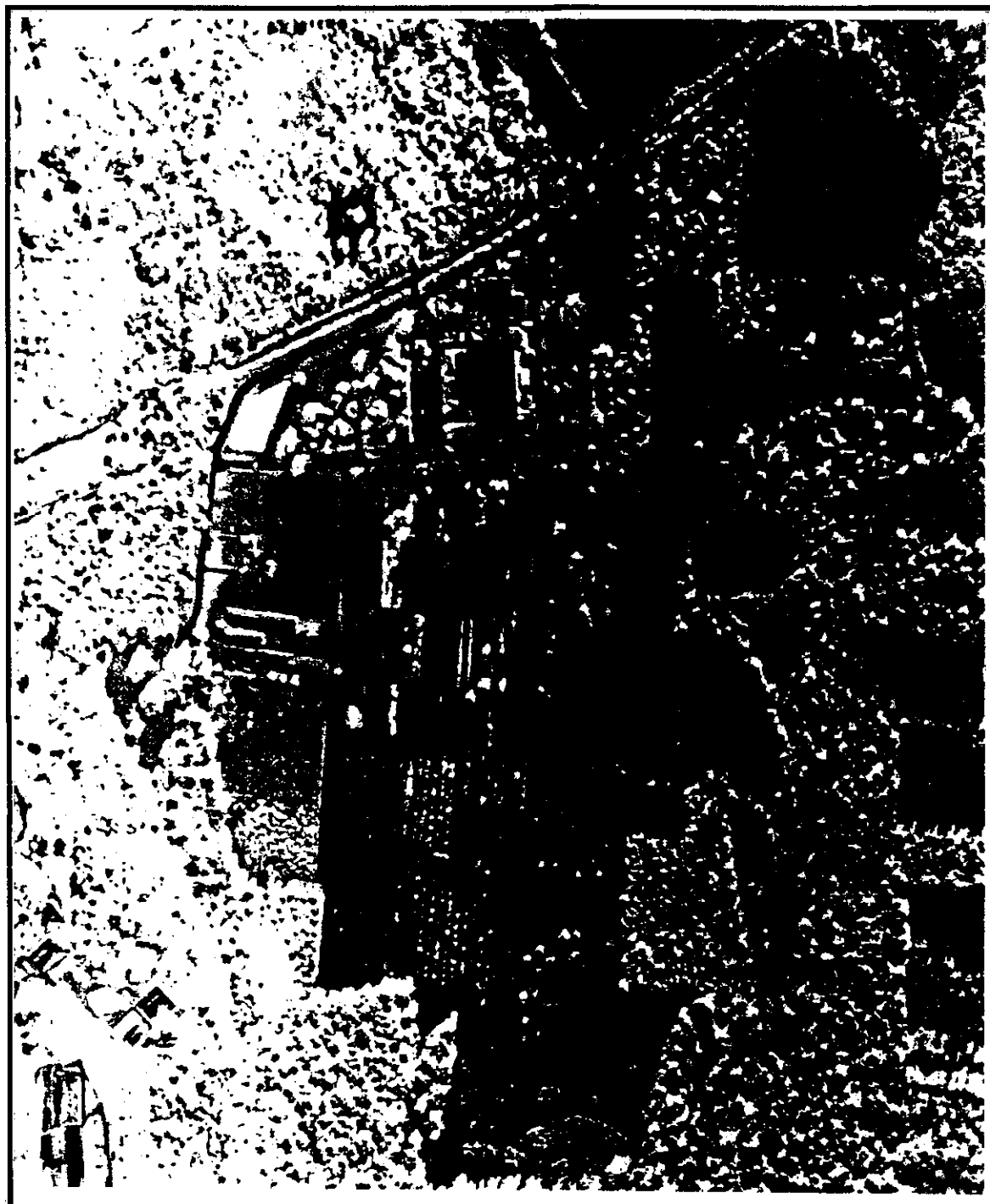
SOME OF MR. ROCK'S INTRODUCTIONS FROM YUNNAN.

The plants collected by Agricultural Explorer J. F. Rock in the remote Province of Yunnan, southwestern China, are being propagated in the United States and distributed to experimenters for trial. Mr. Rock has sent in large quantities of seeds, including many interesting species of *Pyrus*, *Malus*, and other genera well known in the Temperate Zone. The above illustration shows several rows in the nursery at the Plant Introduction Garden, Bell, Md., where these plants have been grown during the past summer; on the left is an undetermined species of *Sorbaria*, in the right center (two rows) a species of *Photinia*, and on the extreme right a *Pyracantha*. (Photographed by Wilson Popenoe, August 27, 1923; P35030FS.)

Plant explorer J.F. Rock in the nursery at the U.S. Plant Introduction Station at Glenn Dale, Maryland, 1923. Source: *Plant Immigrants*, March 1924.



Survey of the 20 acres at the south of the U.S. Plant Introduction Station at Glenn Dale, Maryland, purchased in 1940, conducted by Edward L. Latimer & Son, August 29, 1939. Source: National Archives and Records Administration, Record Unit 54, Entry 135F, Box 7.



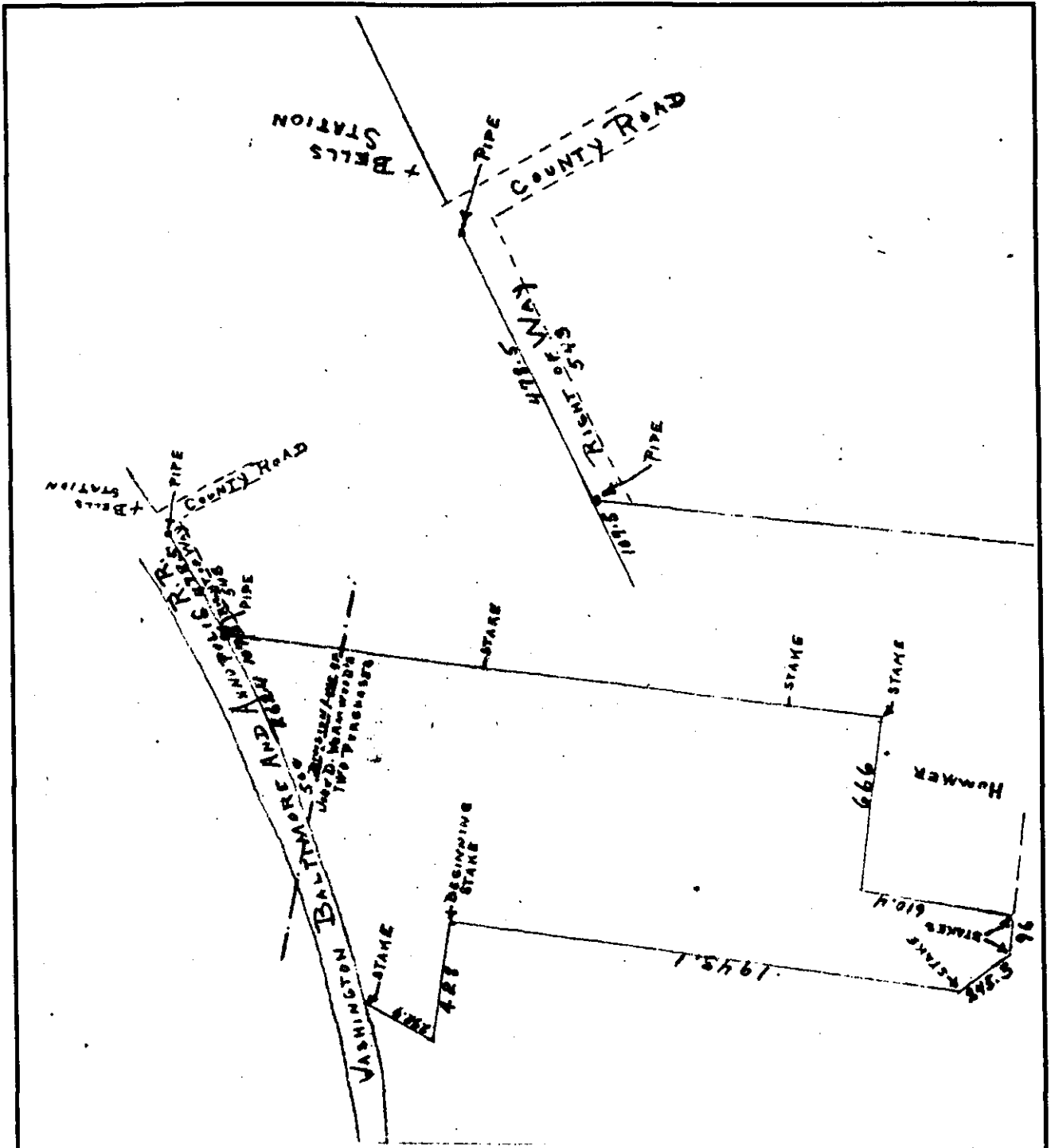
Aerial photograph of the U.S. Plant Introduction Station, Glenn Dale, Maryland, 1932. Source, National Archives and Records Administration. Record Group 145.



Aerial photograph of the U.S. Plant Introduction Station, Glenn Dale, Maryland, 1938. Source, National Archives and Records Administration, Record Group 145.



The staff of the U.S. Plant Introduction Station at Glenn Dale, Maryland, in front of the Chinese sawtooth oak, ca. mid-1930s. Source: the files at the U.S. Plant Introduction Station, Glenn Dale, Maryland.



Survey of the government property at the U.S. Plant Introduction Station at Glenn Dale, Maryland, showing right of way, n.d. Source: the files at the U.S. Plant Introduction Station at Glenn Dale, Maryland.